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ABSTRACT

This workbook was written for women interested in obtaining information about athletic training. Rather than tell the individual how to do something, the workbook refers her to sources where she can find information on how to do it. The workbook consists of two sections. The first is a blank course outline and includes the following parts: (a) Introduction to Athletic Training, (b) The Training Room and Athletic Training Products, (c) Terminology and Preparation for Emergencies, (d) Specific Injuries, (e) Conditioning, and (f) Report Forms and Legal Liability. At the end of each chapter is a list of references as well as handouts that may be useful to the clinic participant, student, or reader. The second section, consisting of two parts, is included to test the individual's understanding of material presented at one of the clinics or in a class, and/or to supply additional information. Part 1 is a series of questions for which the reader is to fill in blanks. Answers are provided with each question. Descriptions of injury situations that a physical education instructor, coach, or student trainer might encounter are presented in part 2. Readers decide how they would handle the situation and compare their answers with those given in the workbook. (Author/PB)

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WORKBOOK: FUNDAMENTALS OF ATHLETIC TRAINING FOR WOMEN

By Holly Wilson
Certified Athletic Trainer
University of Iowa

Text Illustrated by
Michael "Pete" Engle
and David Wright

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Preface

The injured athlete is an undesirable but often unavoidable consequence of athletic competition. The question of how to promptly and properly care for the injured individual has not been of major concern until recently. Within the last two years interest in the care and prevention of athletic injuries has grown phenomenally. Perhaps the rapid growth and development of interscholastic and intercollegiate sports for girls and women, the recent availability of athletic funds, or a fear of litigation have stimulated this interest. Whatever the cause, the effect is evident.

From 1972 to the present, over 100 women have joined the National Athletic Trainers' Association (NATA). Prior to 1972, only eight women joined the organization in a six year period from 1966-1972. In the summer of 1973, DGWS and Cramer Products, Inc., a leading manufacturer of athletic training products, co-sponsored an athletic training workshop for women. The response was so great that six workshops were scheduled this summer. At the 1974 National AAHPER Convention, the Drop-In Center in Athletic Training was such a success that another is already being planned for the 1975 convention. Both the NAGWS and the NATA have become concerned about providing better care for the injured female athlete. Each has formed a special committee on Women in Athletic Training. In addition, liaison relationships between the two organizations are now being established.

The interest is evident, but no one has provided women with a text on how to establish a training program for their female athletes. Hopefully, Workbook: Fundamentals of Athletic Training for Women will fill a void that has existed for several years. Most authors of training texts assume that a fully equiped training room and unlimited budget are available to women. In reality they are not. The workbook contains numerous hints on how to improvise when budgets are limited and equipment almost non-existant.

Originally, the workbook was prepared upon request of the NAGWS Publications Chairman, Dr. Barbara Hoepner, for the NAGWS National Coaches Clinics scheduled for this fall. As the work progressed, the magnitude of information deemed essential steadily increased until an outline for a 25-30 hour lecture class was developed. Consequently, the publication has many more uses than originally proposed. For example, it could be used as an outline for an introductory class in athletic training for women, or as a resource book. The workbook was written for the physical education instructor, coach, student trainer, or anyone interested in obtaining information about the field of athletic training. Rather than tell the individual how to do something, the workbook refers the individual to sources where she can find information on how to do it.

The workbook consists of two sections. The first section is a blank outline divided into six parts. At the end of each part is a list of references as well as "hand-outs" that may be useful to the clinic participant, student or reader.

The second section, consisting of two parts, is included to test the individual's understanding of the material presented at one of the clinics or in a class and/or to supply additional information. The first part is a series of questions for the reader to fill in the blanks. The answer or answers are provided to the left of each question. Descriptions of injury situations that a physical education instructor, coach or student trainer might encounter at some time are presented in part two. The reader should decide how she would handle the situation and compare her anser with the one given below each situation.

The author is greatly indebted to the following people whose contributions have made this workbook possible.

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Iowa City, Iowa

Holly Wilson
Fall 1974

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Part 1 Introduction to Athletic Training

I. Athletic Training - Care and Prevention of Athletic Injuries

A. Prevention - 60%

1. Conditioning - Poor physical fitness is a major factor in many injuries.

2. Taping

B. Care

1. Immediate Treatment

I = ice

C = compression

E = elevation

2. Therapeutic Agents

Ice vs. Heat?

3. Rehabilitation

a. Range of Motion Exercises

b. Strengthening Exercises

4. Taping

a. Physiological

b. Psychological

II. The Coach - Trainer

A. "The Area of Uncertainty"

B. Recognition of Responsibilities and Limitations

Hierarchy of Responsibility: Physician
Trainer
Coach

III. The Woman Trainer

A. Her Role

B. Opportunities for Study

C. Job Opportunities

D. The National Athletic Trainers' Association

IV. Means of Acquiring Training Skills

A. Classes, Clinics & Workshops

1. American Red Cross - Standard and Advanced First Aid

2. American Academy of Orthopedic Surgeons (430 N. Michigan Av., Chicago, Illinois 60611) - EMT Course, Sports Medicine Clinics

3. American College of Sports Medicine (1440 Monroe St., 3008 Stadium, Madison, Wisconsin 53706)

4. American Corrective Therapy Association

5. American Medical Association (535 N. Dearborn St., Chicago, Illinois 60610)

6. Cramer Products, Inc. (Gardner, Kansas 66030) - Summer Workshops

7. NAGWS (1201 Sixteenth St., N.W., Washington, D.C. 20036)

8. Kendall Company, Bike Athletic Training Products (309 W. Jackson Blvd., Chicago, Illinois 60606)

9. National Athletic Trainers' Association (3315 South St., Lafayette, Indiana 47904)

10. Physical Therapy Association (1156 15th St., N.W., Washington, D.C. 20005)

11. Germantown Academy (Fort Washington, Pennsylvania 19034)

12. Colleges and Universities

B. Periodicals

1. American Family Physician (American Academy of Family Physicians, 1740 W. 92nd St., Kansas City, Missouri 64114)

2. American Journal of Surgery (11 E. 36th St., New York, N.Y.)

3. Athletic Training, Journal of the National Athletic Trainers' Association (3315 South St., Lafayette, Indiana 47904)

4. Athletic Training News (Logan Inc., 848 N. Fair Oaks, Pasadena, California 91103)

5. CIBA Clinical Symposia (CIBA Pharmaceutical Co., Division of CIBA Corp., P.O. Box 1340, Newark, New Jersey 07101)

6. Corrective Therapy Journal (University of Texas, Sutton Hall, Austin, Texas 78712)

7. First Aider, First Aider for Women, The Trainer (Cramer Products, Inc., Gardner, Kansas 66030)

8. JAMA (American Medical Association, 535 N. Dearborn St., Chicago, Illinois 60610)

9. Journal of Sports Medicine (Williams and Wilkins, 428 E. Preston St., Baltimore, Maryland 21202)

10. Journal of Trauma (Williams and Wilkins)

11. Kendall Sports Trail (Kendall Co., 309 W. Jackson Blvd., Chicago, Illinois 60606)

12. Physical Therapy (1156 15th St., N.W., Washington, D.C. 20005)

13. Science and Medicine in Sports (American College of Sports Medicine, 1440 Monroe St., 3008 Stadium, Madison, Wisconsin 53706)

14. The Physician and Sportsmedicine (McGraw-Hill Publ. Co., 4015 W. 65th St., Minneapolis, Minnesota 55435)

C. Related Periodicals

1. Athletic Journal (1719 Howard St., Evanston, Illinois 60202)

2. Coach and Athlete (200 S. Hull, Montgomery, Alabama 36104)

3. Journal of Safety Research (National Safety Council, 425 N. Michigan Av., Chicago, Illinois 60611)

4. Nutrition Today (Nutrition Today Inc., 101 Ridgely Av., P.O. Box 465, Annapolis, Maryland 21404)

5. Scholastic Coach (902 Sylvan Av., Englewood Cliffs, New Jersey 07632)

D. Athletic Training Textbooks

1. American Academy of Orthopedic Surgeons. Symposium on Sports Medicine. St. Louis: C.V. Mosby Co., 1969.

2. AAHPER. Current Sports Medicine Issues. Washington, D.C., 1974.

3. American College of Sports Medicine. Encyclopedia of Sports Medicine. Madison, Wisconsin, 1972.

4. AMA. A Guide for Medical Evaluation of Candidates for School Sports. Chicago, Illinois (OP-209).

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10. Benton-Dickinson. Coaches Manual. Rutherford, N.Y.: B-D Consumer Products, Division of Benton-Dickinson and Co.

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12. Bilik, Samuel. The Trainer's Bible. New York: T.J. Reed and Co., 1956.

13. Brown, B.T. Complete Guide to Prevention and Treatment of Athletic Injuries. West Nyack, N.Y.: Parker Publ. Co., 1972.

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53. Williams, J.G.P. Sports Medicine. Baltimore: Williams and Wilkins Co., 1962.

54. Woodward, Christopher. Sports Injuries. London: Max Parrish, 1954.

E. Films, Video Tapes, Audio Tapes

1. Bike Film Library, The Kendall Company, 309 W. Jackson Blvd., Chicago, Illinois 60606

   a. Ankle Injuries - Their Preventio and Care (Loan, Time - 30 min., 16 mm.)

   b. Prevention and Care of Muscle Injuries (Loan, Time - 20 min., 16 mm.)

2. M.B. Productions, Inc., Dallas, Texas

   a. Anatomy of the Knee (Rental, Time - 21 min., 16 mm.)

   b. Differential Diagnosis and Treatment of the Knee (Time - 22 min., 16 mm.)

3. Jordon Olivar Enterprises, 3760 Cahuenga Blvd., West North Hollywood, California

   a. The Training Manual - Care and Treatment of Common Athletic Injuries (Rental, Time - 32 min., 16 mm.)

4. Palo Alto Medical Clinic, 300 Homer Av., Palo Alto, California 94301

   a. A Case History of a Football Injury (Loan, 16 mm.)

5. U.S. Department of the Army, 1960, Army T F8-3021

   a. First Aid, Part IV - Resuscitation, Mouth to Mouth and Mouth to Nose (Loan, Time - 23 min., 16 mm.)

6. A.A. Savastano, M.D., 205 Waterman St., Providence, Rhode Island 02906

   a. A Study of the Functional Anatomy of the Ligaments and Menisci of the Knee Joint (Loan, 16 mm.)

7. Association - Sterling Offices, 512 Burlington Av., LaGrange, Illinois 60525

   a. The Officials (Loan, Time - 28 min., 16 mm.)

8. The American Medical Association, AMA Film Library, 535 N. Dearborn St., Chicago, Illinois 60601

   a. The Team Physician (Loan, 16 mm.)

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9. Vernon Eschenfelder, Trainer, Houston Independent School District, Houston, Texas

   a. Techniques of Taping and Wrapping of the Ankle and Knee (Loan, Super 8 mm.)

10. Modern Talking Picture Service, Inc., 115 E. Michigan St., Indianapolis, Indiana 46201 or Bike Film Library (see #1)

    a. The Absent Link (Loan, Time - approx. 30 min., 16 mm.)

11. Johnson and Johnson, Jerry Gilbert, Athletic Division, New Brunswick, N.J.

    a. Ski Injuries (Loan, Time - approx. 40 min., 16 mm.)

12. American Film Library, CIDCOM Films Division, 1540 Broadway, New York, N.Y. 10036

    a. Taping for Prevention and Rehabilitation (Purchase)

13. Athletic Institute, 705 Merchandise Mart, Chicago, Illinois 60654

    a. Six video tapes on Preventive Sports Medicine by Dr. James Garrick, Director of Sports Medicine, University of Washington, Seattle, Washington (Purchase singly or in a set)

14. University of California, Extension Media Center, University Extension, Berkeley, California 94720

    a. Fourteen audio cassettes from A Symposium on Innovations in Athletic Conditioning and Sports Medicine, December 1973 (Purchase singly or in a set)

V. The Male and Female Athletes

A. Structural Differences

1. Skeletal System

2. Muscular System

3. Adipose Tissue

B. Implications

1. Lower Center of Gravity

2. Lateral Sway

3. Dislocation of the Patella

4. Predisposal to Specific Injuries

5. Heat Stress

C. Physiological Differences

1. Strength

2. Circulatory System

3. Respiratory System

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Women in Sports:

1. Erdelyi, G.J. "Gynecological Survey of Female Athletes," Journal of Sports Medicine 2: 174, 1962.

2. Gendel, E. "Pregnancy, Fitness and Sports," Proceedings of the Seventh National Conference on the Medical Aspects of Sports, Chicago, 1965, American Medical Association, pp. 43-46.

3. Gilbert, Bill and Nancy Williamson. "Are You Being Two Faced?" Sports Illustrated, June 4, 1973. (This article is the second in a three part series on women in sports.)

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14. "Pregnancy and Sports," The Physician and Sportsmedicine 2 (5): 35-41, May, 1974.

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HOW TO BECOME AN ATHLETIC TRAINER

In order to be certified by the National Athletic Trainers' Association you must complete the following:

General Requirements

1. College graduate (bachelor degree minimum) with teaching license.
2. Work experience in athletic training -
   a. Approved curriculums (2 years of supervised work).
   b. Apprenticeship (1800 hours of supervised work).
   c. Actively engaged in the profession (5 year minimum).
   d. Physical Therapy graduate (2 years of supervised work).
3. N.A.T.A. membership (1 year).
4. Specific letters of recommendation (except curriculum graduates).
5. Successful completion of the certification examination (written, oral, and practical).

Five Ways to Become an Athletic Trainer

1. Approved Athletic Training Curriculums are offered by many colleges and universities.

2. Athletic Trainers Actively Engaged in the Profession but not yet certified. This group may be certified by meeting the above general requirements and showing proof of 5 years experience as designated by the N.A.T.A.

3. Physical Therapy Schools. Most require a "B" average along with a good background of science in order to be admitted. A list of the schools and their entrance requirements may be obtained by writing to: American Physical Therapy Association, 1156 15th St., N.W., Washington, D.C. 20005.

4. Apprenticeship. This catagory may be attained in schools which do not offer approved curriculums. The general requirements mentioned above must be met and letters of recommendation from the team physician and the N.A.T.A. supervising trainer must be included with the application for the certification test.

5. Endorsement may be obtained for those that have passed a class in athletic training or an approved N.A.T.A. workshop. The student must have a teaching license and at least a minor in physical education or health. N.A.T.A. membership and examination requirements cannot be extended beyond 5 years.

ATHLETIC TRAINING CURRICULUMS
N.A.T.A. APPROVED

A. Undergraduate Programs that accept women

1. Appalacian State University
   Boone, North Carolina 28607

2. Ball State University
   Muncie, Indiana 47306

3. Central Michigan University
   Mt. Pleasant, Michigan 48858

4. Indiana State University
   Terre Haute, Indiana 47809

5. Indiana University
   Bloomington, Indiana 47401

6. Louisiana State University
   Baton Rouge, Louisiana 70803

7. University of Montana
   Missoula, Montara 59801

8. University of North Dakota
   Grand Forks North Dakota 58201

9. Northeastern University
   Boston, Massachusetts 02155

10. Ohio University
    Athens, Ohio 45701

11. Oregon State University
    Corvallis, Oregon 97331

12. Southwest Texas State University
    San Marcos, Texas 78666

13. Mankato State University
    Mankato, Minnesota 56001

14. University of Iowa
    Iowa City, Iowa 52240

15. University of Oregon
    Eugene, Oregon 97403

16. Washington State University
Pullman, Washington 99163

17. West Chester State College
West Chester, Pennsylvania 19380

18. Western Illinois University
Macomb, Illinois 61455

B. Graduate Programs that accept women

1. University of Arizona
Tucson, Arizona 85721

2. Indiana State University
Terre Haute, Indiana 47809

C. Undergraduate Programs that were approved in June 1974 but status is unknown

*1. East Carolina University
Greenville, North Carolina 27834

*2. Eastern Illinois University
Charleston, Illinois 61920

*3. Fullerton State University
Fullerton, California 92634

*4. North Dakota State University
Fargo, North Dakota 58102

*5. Northridge State University
Northridge, California 91324

*6. Slippery Rock College
Slippery Rock, Pennsylvania 16057

*Accepts women

SCHOOL OF HEALTH
PHYSICAL EDUCATION & RECREATION
INDIANA STATE UNIVERSITY

Dept. of Phys. Ed. for Men
Athletic Training Specialization

Summary Sheet
Undergraduate

Name_____ Soc. Sec. No._____
(Last) (First)

For Physical Education Majors: (24 semester hours)

PHYSICAL EDUCATION

MPE	293	2 hrs	Strength, Conditioning & Rehabilitation
MPE	295	3 hrs	Introduction to Athletic Training
MPE	392	2 hrs	Medical Aspects of Athletic Training
MPE	393	2 hrs	Athletic Therapy Modalities
MPE	394	2 hrs	Training Room Practice
MPE	395	2 hrs	Training Room Practice
MPE	480	3 hrs	Physiology of Exercise
MPE	492	3 hrs	Diagnostic Techniques of Athletic Training
MPE	495*	2 hrs	Field Experience in Athletic Training

*Enroll during professional semester. To be done with student teaching.

HOME ECONOMICS

H. Ec.	201	3 hrs	Fundamentals of Nutrition

For students other than Physical Education majors, the following courses are additional requirements: (43 semester hours)

HEALTH & SAFETY

HLSF	111	2 hrs	Personal Hygiene Science
HLSF	211	2 Hrs	First Aid

PHYSICAL EDUCATION

MPE	380	3 hrs	Kinesiology

LIFE SCIENCE

LSC	231	3 hrs	Human Anatomy & Physiology I
LSC	241	3 hrs	Human Anatomy & Physiology II

PSYCHOLOGY

PSY	101	3 hrs	General Pscychology
Ed. PSY	202	3 hrs	Psychology of Childhood & Adolescence

All courses are open to men and women.
N.A.T.A. Approved Curriculum

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SCHOOL OF HEALTH
PHYSICAL EDUCATION & RECREATION
INDIANA STATE UNIVERSITY

Dept. of Phys. Ed. for Men

Summary Sheet
Graduate

Name_____ So. Sec. No._____
(Last) (First)

Indiana State University offers an opportunity to combine 21 semester hours of graduate work in Athletic Training and allied fields with a Master's Degree in Physical Education.

The following courses are recommended for certification by the N.A.T.A.

Graduate Athletic Training Courses: (21 semester hours)

PHYSICAL EDUCATION			
MPE	580	3 hrs	Physiology of Exercise
MPE	691	3 hrs	Advanced Techniques of Athletic Training I
MPE	692	3 hrs	Advanced Techniques of Athletic Training II
MPE	693	3 hrs	Seminar in Current Trends of Athletic Training
MPE	694	3 hrs	Practicum in Athletic Training I
MPE	695	3 hrs	Practicum in Athletic Training II
MPE	697	3 hrs	Adapted Physical Education

Pre-requisite Undergraduate Courses: (24 semester hours)

HEALTH & SAFETY			
HLSF	111	2 hrs	Personal Hygiene Science
HLSF	211	2 hrs	First Aid
PHYSICAL EDUCATION			
MPE	292	2 hrs	Care and Prevention of Athletic Injuries
MPE	380	3 hrs	Kinesiology
LIFE SCIENCE			
LSC	231	3 hrs	Human Anatomy & Physiology I
LSC	241	3 hrs	Human Anatomy & Physiology II
PSYCHOLOGY			
PSY	101	3 hrs	General Psychology
Ed. PSY	202	3 hrs	Psychology of Childhood and Adolescence
HOME ECONOMICS			
H. Ec.	201	3 hrs	Fundamentals of Nutrition

All courses are open to men and women.

Courses which have been satisfied on an undergraduate level will be waived and approved electives substituted.

N.A.T.A. Approved Curriculum

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APPLICATION FOR MEMBERSHIP
IN THE
NATIONAL ATHLETIC TRAINERS' ASSOCIATION

18

Mr.
Mrs.
Name Miss _____ Social Security Account No _____ Date of Application _____
LAST FIRST MIDDLE NICKNAME

Permanent Mailing Address _____
STREET AND NUMBER CITY STATE ZIP CODE AREA CODE PHONE NUMBER

Present Address _____
STREET AND NUMBER CITY STATE ZIP CODE AREA CODE PHONE NUMBER

Present Position _____
ASSIGNMENT EMPLOYER ADDRESS

Date of Birth _____ Height _____ Weight _____
MONTH DATE YEAR

U. S. War Veteran? _____ Present Military Status _____

Have you ever been a member of NATA or made previous application? Yes _____ No _____ If yes, explain _____

If membership refused — Why? _____

Membership Classification Desired _____

Are you at present actively engaged in the Athletic Training Profession? Yes _____ No _____

If you are not actively engaged in the Athletic Training profession, on what do you base your request for membership in this organizatio

I hereby apply for membership in the National Athletic Trainers' Association and enclose $_____ as my annual membership dues

the year 19____ ($_____ is for my National dues and $_____ is for District dues.) If accepted as a member of this associ tion it is my desire to advance its interests and ideals to the best of my ability and to abide by the constitution and by-laws.

Signature of Applicant _____

Signature of Sponsor _____ Certification Number _____
TO BE SIGNED BY A CERTIFIED MEMBER OF THE APPLICANT'S DISTRICT

Send application to the District Secretary. The information submitted will be evaluated by the District Membership Committee. If application accepted you will receive a membership card from the NATA Executive Director. If you do not qualify for membership, your dues payment w be refunded.

DO NOT WRITE BELOW THIS LINE. Must be filled out in duplicate.

RETURN APPLICATION AND DUES TO:

N.A.T.A. Office
3315 South Street
Lafayette, Indiana
47904

District _____ Approval by _____

Date _____

Membership approval sent to National Office

Classification Granted _____

Part 2 The Training Room and Athletic Training Products

I. The Training Room

A. Recommendations for the Ideal Setting

1. Location

2. Size

3. Ventilation

4. Lighting

5. Paint

6. Floor

B. The Women's Training Room

1. Necessities

a. Running Water and Sink

b. Good Lighting

c. Treatment Table

d. Telephone (Private Line)

e. Locked Storage Space

f. Refrigerator

2. "Frills"

II. Exercise Equipment

A. Ankle Exerciser

1. Elgin Leg-Ankle Exerciser (J.A. Preston, 71 Fifth Av., New York, N.Y. 10003)

2. Logan Ankle Exerciser (Logan, Inc., 848 N. Fair Oaks, Pasadena, California)

3. Improvised Exerciser (See building plans.)

B. Knee Machines

1. Iron Boot

Precautions: Weight Limitations

2. Logan Knee Machine (Logan, Inc., 848 N. Fair Oaks, Pasadena, California)

Precautions: Breaking of Springs

Improvisation

3. Elgin Knee Table (J.A. Preston, 71 Fifth Av., New York, N.Y. 10003)

4. Universal Knee-Thigh Machine (Universal Athletic Sales, 1328 N. Sierra Vista St., Fresno, California 93703)

5. Improvised Machine (See building plans.)

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C. Methods of Applying Overload

1. Sandbags

2. Empty Bleach Bottles Filled with Sand (JOHPER, May 1967)

3. Empty Can with Brick

4. Surgical Tubing

5. Disc Weights

D. Use of Existing Facilities for Conditioning and Rehabilitation

1. Swimming Pool

a. Relaxation

b. Strengthening of Muscles and C-V Endurance

2. Track

3. Bleachers

Precautions: Do Not Run Down

Do Not Turn Feet Outward

4. Bicycle Ergometer

Precautions: Athlete Must Have Full Leg Extension

III. Modalities: All agents used in the treatment of an injury.

A. Heat

1. Physiological Reactions

a. Vasodilation

b. Muscle Relaxation

c. Healing Initiated

2. Precautions: Do Not Use Heat If

a. Injury is recent (within last 24-72 hours)

b. Metal is embedded in or near injured area

c. Circulatory disturbance is present

d. Injury involves the eyes or genital area

e. Sensation is lost

3. Indications

4. Common Forms of Superficial Heat

   a. Whirlpool

      (1) Advantages

      (2) Length of Treatment

      (3) Temperature of Water

      (4) Precautions

   b. Hydrocollator

      (1) Advantages

      (2) Disadvantages

      (3) Length of Treatment

      (4) Precautions

c. Infra-red with a Moist Towel

(1) Advantages

(2) Length of Treatment

(3) Placement of Lamp

(4) Precautions

d. Analgesic Pack

(1) Materials Needed

(a) Mild Analgesic

(b) Combine

(c) Elastic Wrap

(d) Tape

(2) Application

(3) Advantages

(4) Precautions

(a) Sensivity to Heat

(b) Secure Wrap

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e. Contrast Baths

(1) Hot Water

(2) Cold Water

5. Deep Heat - Ultrasound

a. Application

(1) Length of Treatment

(2) Intensity Level

(3) Coupling Agent

b. Precautions

(1) Keep the Sound Head Moving

(2) Keep the Intensity Low

B. Cold

1. Physiological Reactions

a. Vasoconstriction

b. Muscle Relaxation

c. Anaesthetic

d. Vasodilation

2. Precautions

a. Raynaud's Syndrome

b. Frostbite - Water freezes at 0° C. while tissues freeze at -4° C.

(1) Ethyl Chloride: "Spray Ice"

(2) Ice Slush + Salt

3. Sensations

a. Burning

b. Tingling

c. Numbness

4. Common Methods of Applying Ice

a. Ice Pack

(1) Application

(2) Length of Treatment

b. Ice Slush

(1) Application

(2) Length of Treatment

c. Ice Massage

(1) Application

(2) Length of Treatment

d. Chemical Cold Pack

(1) Non-reusable

(2) Reusable

(3) Precautions: Leaking Packs

e. Gel Packs

f. Spray Ice

5. Advantages of Ice

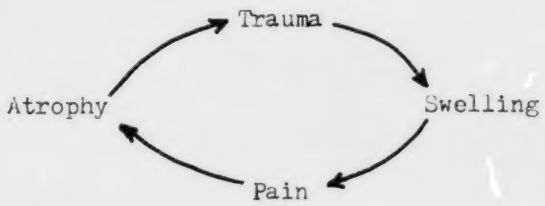
   a. Inexpensive

   b. Muscle relaxation lasts longer

   c. Anaesthetic

   d. Swelling is controlled through vasoconstriction

C. Vicious Cycle



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IV. Athletic Training Products

A. Necessities

1. Tape, $1\frac{1}{2}$" white porous

2. Tape Adherent

3. Tape Remover

4. Bandage Scissors, $5\frac{1}{2}$" and $7\frac{1}{4}$"

5. Tape Cutters and Single Edge Razor Blades

6. Band aids, 1" and Extra Large

7. Sterile Gauze Pads

8. Non-sterile Gauze Rolls

9. Non-sterile Gauze Sponges

10. First Aid Cream

11. Soap

12. Alcohol or substitute that does not burn

13. Hydrogen Peroxide

14. Cotton-tipped Applicators

15. Tongue Depressors - Juniors

16. Elastic Wraps

17. Cold Packs

18. Vinyl Foam (School Health Supply Co., 300 Lombard Rd., Addison, Illinois 60101)

19. Combine

20. Analgesic, a mild water-soluble brand

21. Vaseline or substitute

22. Safety Pins and Rubber Bands

23. Needle and Thread

24. Ice Jug

25. Plastic Bottles and Ointment Jars (Harold Mundy, Athletic Training Supply Co., 21238 W. Seven Mile Rd., Detroit, Michigan 48219)

26. Training Kit

Money Saving Tips*

1. Use ice from the cafeteria, concession stand or bag ice instead of commercially made chemical cold packs. Aerosol cold sprays are dangerous and unnecessary. Plastic bags and ice will be sufficient for all your needs.

2. When purchasing elastic wraps, buy the cheapest ones available. Check with the manufacturer about buying "seconds". They are end pieces sewn together.

3. Cups for ice massage can be re-used. Put a tongue depressor in the water before freezing and use it as a handle during application. If you do not use a tongue depressor handle, buy non-waxed paper cups. The ice will not slip out of the cup as easily. Metal orange juice cans may be used as freezing containers if available.

4. Use Amojell, Snow White Petrolatum, instead of Skin Lube or Vaseline to reduce friction. Amojell is manufactured by Standard Oil Company and may be purchased at a distribution plant.

5. Use old pieces of towel or Pampers Diapers as a covering for analgesics packs.

6. Instead of analgesic, use a piece of a Johnson and Johnson back plaster for an analgesic pack.

7. Warm, wet towels or hot water bottles can be used in place of a hydrocollator pack. A 15-20 minute hot shower with the nozzle focused on the injured part is also a suitable substitute.

8. A hydrocollator park may be warmed in a pan of water on a hot plate.

9. Cornstarch is an inexpensive substitute for powder. It can be used for irritations between the legs. It may also be used in the shoes, but should <u>not</u> be placed in the socks.

10. Buy aspirin, antacid and salt tablets from a reputable drug store, drug supply company, or your student health center rather than purchasing these items from a company selling sporting goods. Buy the cheapest aspirin possible. All aspirin has the same chemical formula and you pay extra for the brand name. Also purchase antiseptic creams at the above sources.

11. Buy non-sterile gauze pads (sponges) in bulk to use for instep pads. If you have a lot of skin irritation problems, Nu-Wrap gauze rolls may be used as an underwrap before taping. Nu-Wrap gauze rolls are manufactured by Johnson and Johnson.

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*Many of these money saving tips were provided by Richard Carey, Certified Athletic Trainer at Garfield High School in Seattle, Washington.

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12. A good shaving cream may be used in place of Cinder Suds.

13. A good theatrical cream may be used in place of Sun Glare Black.

14. Use old wool socks as ice packs. Fill the sock with ice and tape shut. Store the pack dry and wet with water just before use.

15. Fill plastic bottles with sand to use as weights.

16. Use surgical tubing to provide overload in practicing a sports skill. For example, tape a hardball to one end of the tubing and tape a piece of cotton twill (1-2" wide) to the other. Secure the cotton twill in the crack of a door and go through the mechanics of throwing the ball. Do not release the ball.

17. Tongue depressors make good, temporary finger splints for suspected fractures. Cautiously bend the depressor and maintain its curved position by placing a "bow string" of tape end to end. Pad the splint by encircling it with tape.

18. Make canvas bags and fill them with sand for external weights.

19. Take a large fruit can and cut out both ends. Put a brick in one end and your shoe in the other. Use pliers to conform the can to the shoe. Use as an external weight for early rehabilitation of the foot, ankle or knee.

20. Make simple exercise machines to strengthen the ankle and knee. A simple knee machine may be made from two pieces of wood and a piece of dowel. Hinge the two pieces of wood together and attach the dowel to the end of one piece. Pad the dowel with a piece of vinyl foam. Place one board flat on a table so the other board hangs over the side. Sit on the board and hook the injured leg behind the dowel. Put disc weights on the other end of the dowel and then straighten the injured leg.

21. Use a fishing tackle box as a trainer's kit. It may be necessary to remove the tray on one side so large spray cans can stand upright.

22. Make your own pads and donuts from vinyl foam.

23. Save empty perscription bottles and plastic bottles for your training kit.

24. Use a tooth brush holder to store tongue depressors and cotton-tipped applicators.

25. Make your own "Gatorade" - 1½ packages of Kool Aid, 1 gallon of water, 1½ cups of sugar and 1 teasp. of salt. To add potassium, use white molasses - 1 pt. to 5 gallons of water.

26. Substitute Stan-o-sol for tape remover. Stan-o-sol is manufactured by Standard Oil and may be purchased at a distribution plant.

27. Empty perscription bottles may be obtained from a local druggist.

28. Use a tongue depressor as a spreader for Vaseline and analgesic. To remove small amounts of ointment from a bulk container, use a rubber scraper.

29. Use a cotton dental plug or Tampax to stop a nose bleed. Cut the Tampax in half and a small "V" in the tip. Spray the plug with an astringent and put Vaseline on the tip before inserting it. Leave one end sticking out of the nostril so the plug can be easily removed. You might be able to obtain dental plugs from a local dentist.

30. Use non-sterile gauze sponges rather than cotton balls for clean ups - removing tape adherent. Remember the gauze is not sterile so it should not be used to clean wounds.

31. Buy $1\frac{1}{2}$" white athletic tape and split into the desired widths.

32. Use a swimming pool for conditioning and rehabilitation. The water provides resistance for strengthening muscles and its buoyancy eliminates the pain of movement associated with new injuries.

33. A hyperextension brace and/or a live rubber wrap can be made out of an old inner tube.

34. When you purchase aerosol cans you are paying for air. Buy tape adherent in liquid and paint it on the skin with a paint brush. Or make a spreader from a tongue depressor and a piece of adhesive felt. Staple the felt to the end of the depressor.

35. A heel lift for taping knees can be made from the plastic spool centers of Bike tape. Tape the spools in a circle and tape a piece of sponge rubber or vinyl foam on the top.

B. Sources of Athletic Training Products and Equipment

1. Local sporting goods store or surgical supply company

2. Arco, Box 921, Terre Haute, Indiana 47808 (Knee Braces)

3. Arno Adhesive Tapes, Inc., Athletic Division, P.O. Box 301, Michigan City, Indiana 46360 (Tape and Dr. Scholl's Products)

4. Athletic House, P.O. Box 1085, Knoxville, Tennessee 37901 (General Athletic Training Supplies)

5. Bacharach Instrument Co., T & M Sales Group, 625 Alpha Dr., Pittsburg, Pennsylvania 15238 (Sling Psychrometer)

6. Breath-O'-Life, The Arcade, Cleveland, Ohio (Oxygen)

7. Burdick Co., Milton, Wisconsin (Electromedical Equipment - Ultrasound, Diathermy)

8. Chattanooga Pharmacal Co., Chattanooga, Tennessee 37405 (Hydrocollator, ColPac)

9. Comfort Care Products, Inc., P.O. Box 268, Pontotoc Industrial Park, Pontotoc, Mississippi 38863 (Splints, Braces)

10. Cramer Products, Inc., Gardner, Kansas 66030 (Athletic, First Aid and Trainer's Supplies)

11. Dakon Corp., 1836 Gilford Av., New Hyde Park, New York 11040 (Whirlpools)

12. Del Chemical Corp., W. 158 N. 9332 Nor-X-Way Av., Menomonee Falls, Wisconsin 53051 (General Athletic Training Supplies)

13. Duke Laboratories, Inc., Duke Place, South Norwalk, Conn. (Elastoplast, elastic adhesive tape)

14. DePuy Inc., Warsaw, Indiana 46580 (Splints, Braces)

15. Dynamed, Inc., P.O. Box 2157, Leucadia, California 92024 (First Aid Supplies, Ladder Splints)

16. Econoline Products, Inc., P.O. Box 201, Davidson, North Carolina 28036 (Underwrap, Heel & Lace Pads)

17. Elmer's Weights Inc., P. O. Box 16326, Lubbock, Texas 79417 (Ankle Weights, Weights-You-Wear)

18. Ille Electric Corp., Reach Rd., Williamsport, Pennsylvania 17701 (Hydrotherapy Equipment)

19. Johnson and Johnson, Athletic Division, New Brunswick, New Jersey (First Aid, Medical and Trainer's Supplies, Tape)

20. Kendall Products, Bike Athletic Division, 309 W. Jackson Blvd., Chicago, Illinois 60606 (Tape, Trainer's Supplies, Braces)

21. Larson, Labratories, Erie, Pennsylvania 16505 (Mint Glo, Trainer's Supplies)

22. Logan, Inc., 848 N. Fair Oaks, Pasadena, California (Training Supplies, Whirlpools)

23. Medco Electronics Co., Tulsa, Oklahoma (Ultrasound)

24. Mueller Chemical Co., Highway PF, Prairie du Sac, Wisconsin 53578 (General Athletic Training Supplies)

25. Harold Mundy, Athletic Training Supply Co., 21238 W. Seven Mile Rd., Detroit, Michigan 48219 (Live Rubber Wrap, Plastic Bottles, Training Supplies, Whirlpools)

26. New Method Bandage Inc., P.O. Box 224, Rome, New York 13440 (General Athletic Training Supplies)

27. OEC, Orthopedic Equipment Co., Inc., Bourbon, Indiana 46504 (Splints, Braces)

28. Parke Davis & Co., Medical-Surgical Products Div., Detroit, Michigan 48232 (Tape)

29. J.A. Preston, 71 Fifth Av., New York, New York 10003 (Rehabilitation, Hydrotherapy, and Electrotherapy Equipment)

30. Protective Products, 1913 Pine, P.O. Box 291, Grand Prairie, Texas 75050 (Training Supplies)

31. Protek-Toe Products, 2235 B Morris Av., P.O. Box 1324, Union, New Jersey 07083 (Foot Pads, Adhesive Foam and Felt)

32. Purdue Fredrick Co., Norwalk, Connecticut o6856 (Betadine)

33. Richards Manufacturing Co., Splint and Fracture Management Supplies, 1450 Brooks Rd., Memphis, Tennessee (Splints, Braces)

34. School Health Supply Co., 300 Lombard Rd., Addison, Illinois 60101 (General Athletic Training Supplies)

35. 3M, Medical Products Div., 3M Center, St. Paul, Minnesota 55101 (First Aid Supplies, Tape)

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36. Universal Athletic Sales, 1328 N. Sierra Vista St., Fresno, California 93703 (Conditioning and Rehabilitation Equipment)

37. Whitehall Medical Co., 19 Wall St., Passacic, New Jersey (Whirlpools)

38. Wolverine Sports, 745 State Circle, Ann Arbor, Michigan 48104 (Conditioning and Rehabilitation Equipment, Sporting Goods)

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1. Behnke, Robert et al. "Planning a Budget Training Room," Kendall Sports Trail 27: 2, Nov.-Dec., 1972.

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6. Wolfert, Kenneth. "Athletic Facility Safety," Kendall Sports Trail 27: 4, March-April, 1973.

Modalities:

1. Behnke, Robert. "Cryotherapy and Vasodilation," Athletic Training 8 (3): 106, September, 1973.

2. Dayton, O. William. Athletic Training and Conditioning. New York: The Ronald Press Co., 1965.

3. Edwards, A.G. "Increasing Circulation with Cold," Journal of the National Athletic Trainers' Association 6 (1): 15-16, Spring, 1971.

4. Klafs, C.E. and D.D. Arnheim. Modern Principles of Athletic Training. St. Louis: C.V. Mosby, 1973.

5. Licht, Sidney, ed. Therapeutic Heat and Cold. New Haven, Conn.: E. Licht, Publ., 1960.

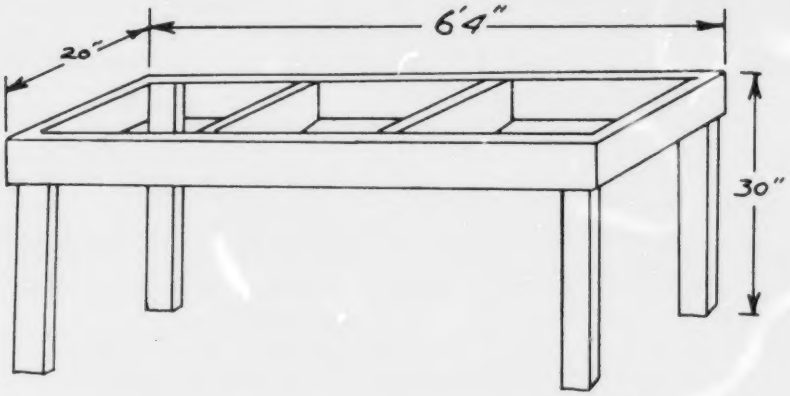
6. Novich, Max. "Physical Therapy in the Treatment of Athletic Injuries," Texas State Journal of Medicine 61: 672-4, September, 1965.

7. Watkins, Arthur. A Manual of Electrotherapy. Philadelphia: Lea and Febiger, 1962.

Improvising Equipment:

1. Dupont, Elizabeth. "How to Make and Use Plastic Weights," JOHPER, May, 1967.

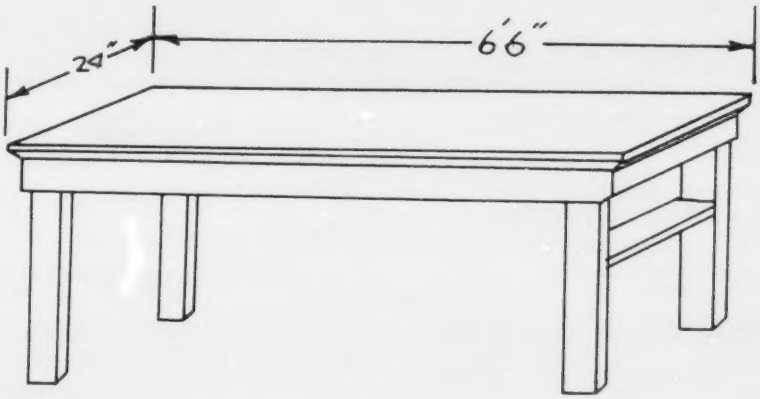
2. Patrick, Chris. "Uses and Reasons of Disposable Plastic Bags in the Training Room," Athletic Training 7 (1): 14, March, 1972.



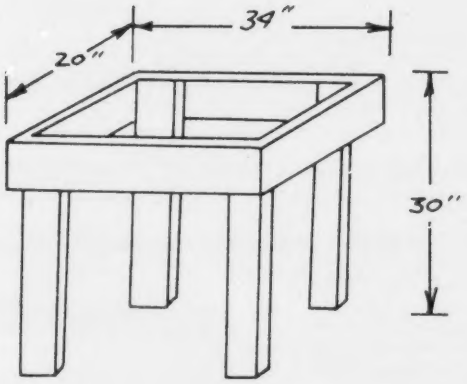
TRAINING TABLE

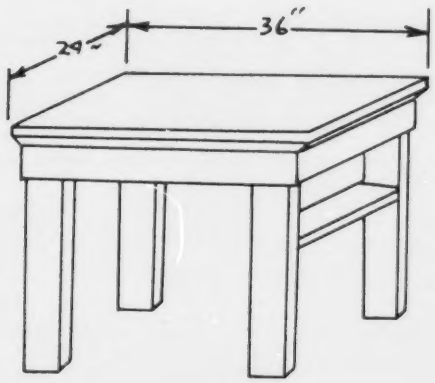
This table is used primarily for treatment of injuries, but may be used for taping.

Legs should be made from either 4" x 4" or full 3" x 3" material. It will be necessary to brace legs.



Top is constructed from 3/4" plywood, padded with 1/4" sponge rubber or cotton mattress pads, and is covered with a heavy plastic material.



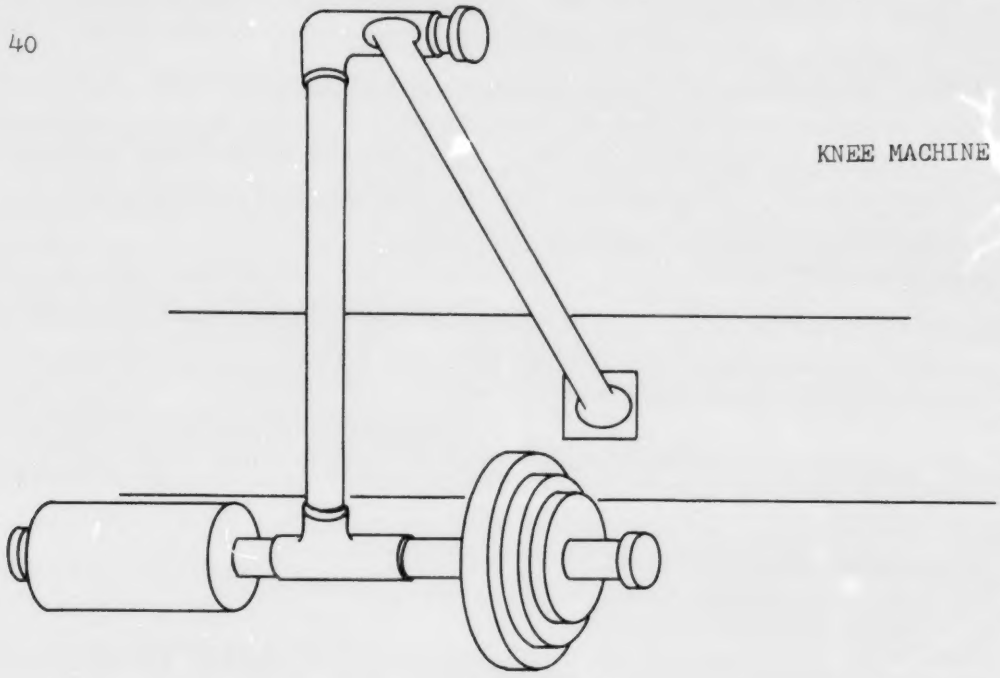


TAPING TABLE

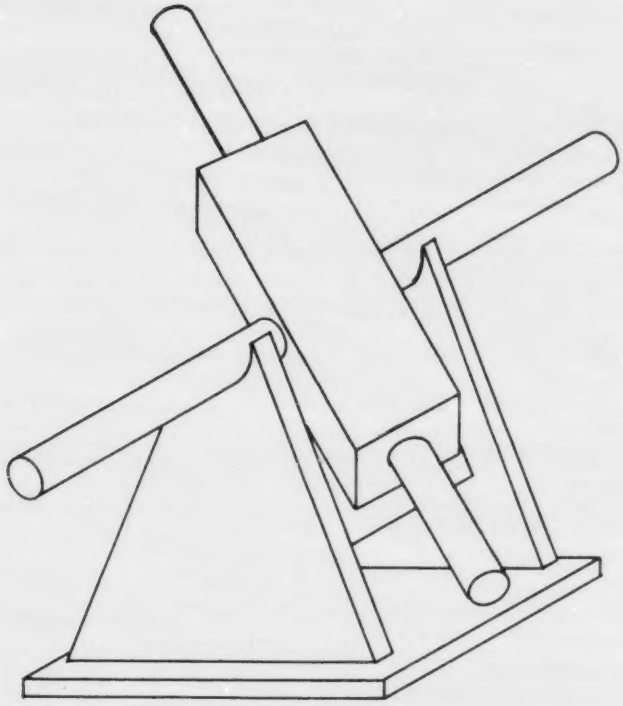
This table is used primarily for taping, but two tables can be pushed end to end for the treatment of injuries

Mel Blickenstaff
Indiana State University

KNEE MACHINE



ANKLE EXERCISER



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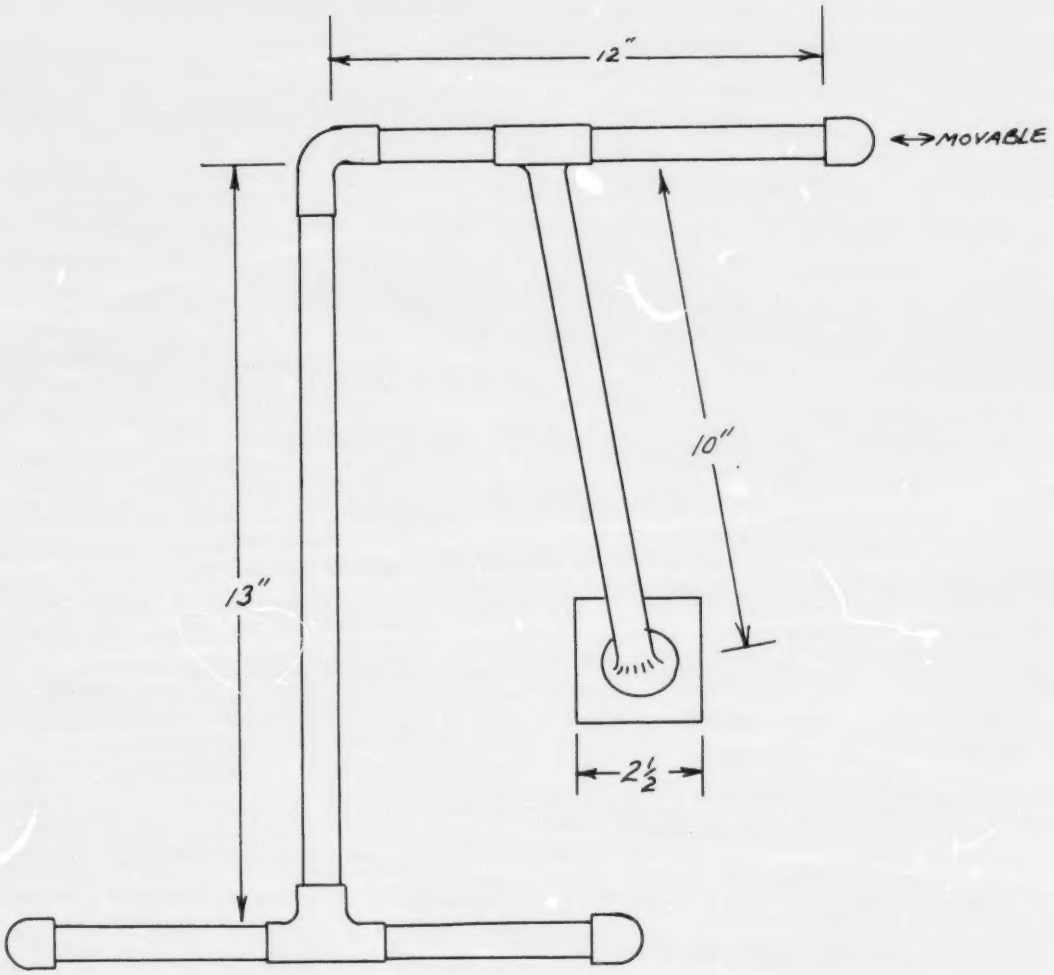
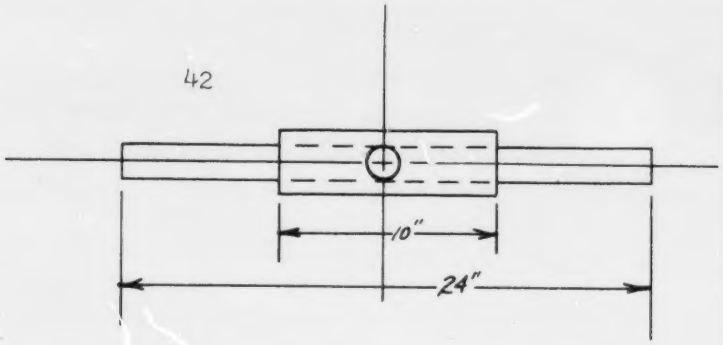
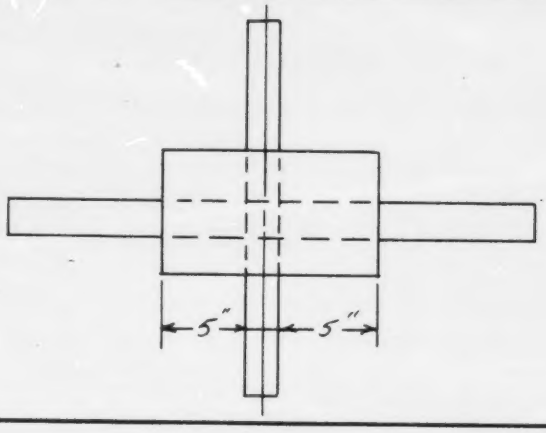


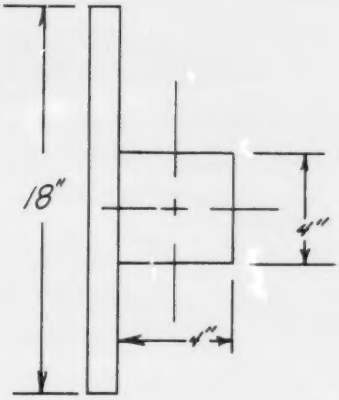
KNEE MACHINE
1" pipe
Elbow piece
T piece - 2
End caps - 3
End plate
Coupling

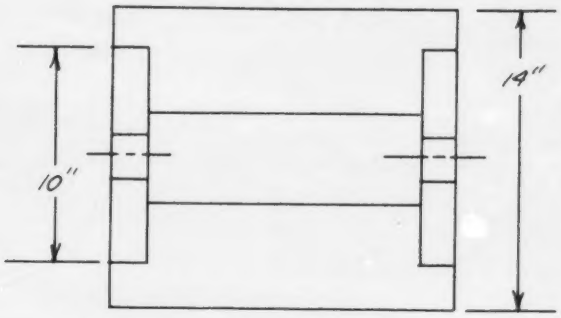
42

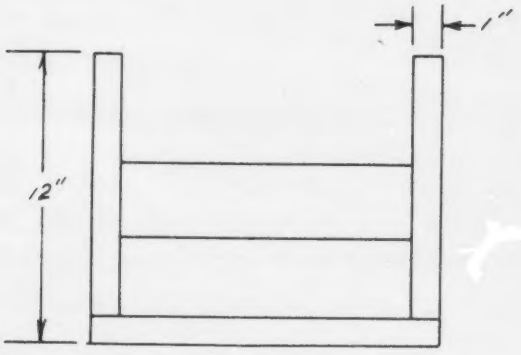
ANKLE EXERCISER

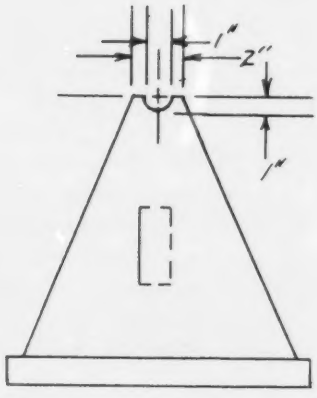








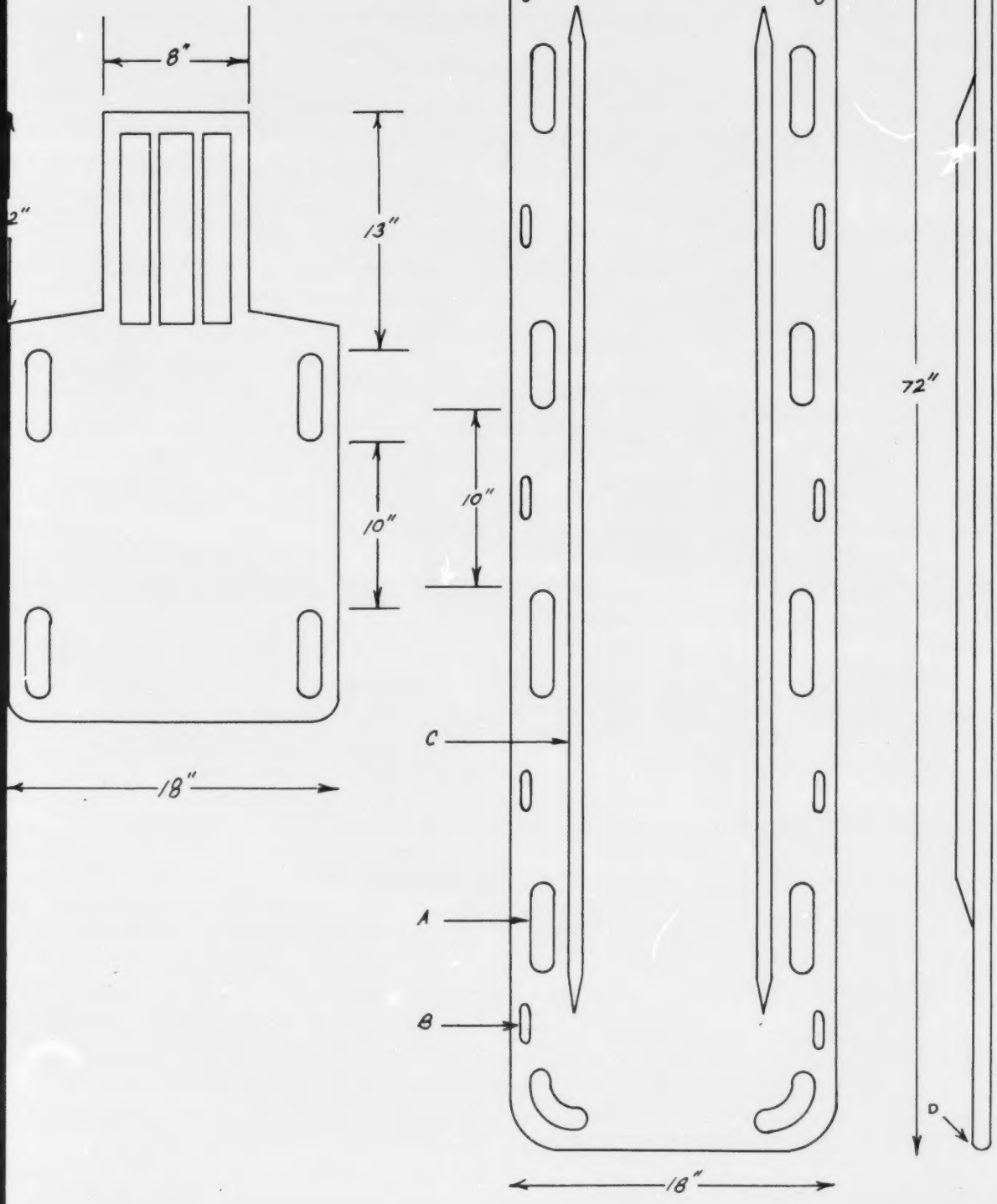




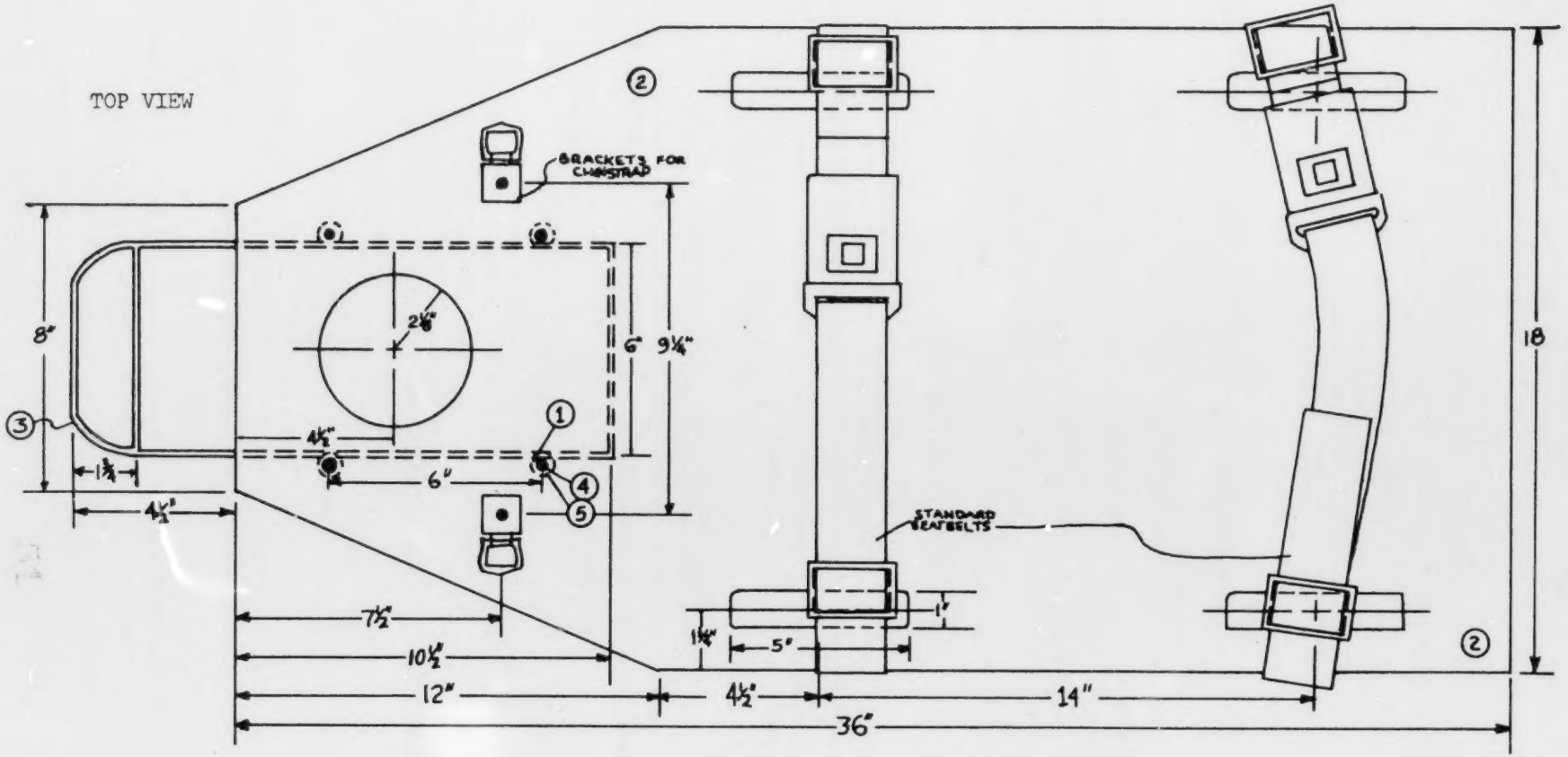
SPINE BOARD

Long Spine Board

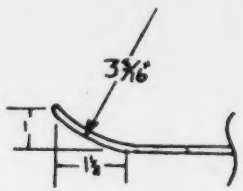
Short Spine Board



TOP VIEW



PARTIAL
SIDE VIEW



NECK IMMOBLIZER
William Newell
Purdue University

NO.	MATERIAL	NO. REQ
1	3/16"wash	4
2	1/2" ply	-
3	3/16"bar	-
4	3/16"bolt	4
5	3/16"nut	4

Scale 1/3

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BACK BOARD
William Newell
Purdue University

NO.	MATERIAL	NO. REQ
1	1/2" ply	-
2	3"web belt with buckle	1
3	2"web belt with buckle	2
4	5/16"bolt 4"	2
5	5/16"wash	4
6	5/16"wing nut	2
7	1" D ring	1
8	3"x3"x5" fiber glass block	2
9	3"x3"x1/4" rubber	2
Scale 1/4"/1/2"		

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THE THERAPEUTIC USE OF COLD IN THE CARE OF ATHLETIC INJURIES*

Techniques of Cold Application

There are several methods by which cryotherapy may be applied. One should remember that ice therapy is instituted after internal hemorrhage has been controlled with the standard first aid procedures.

THE USE OF COLD TOWELS which have been immersed for a period of time in a shaved ice and water slush has been used and reported by Knott and her co-workers. Knott suggests that the mixtures of ice and water be kept at a temperature under 58°F. In actual practice, when using a shaved ice and water mixture, the temperature of the mixture has been found to range from 34° to 40°F. At these lower temperatures one seems to achieve more satisfactory clinical results. If shaved ice is not available, crushed or cubed ice can be used. In this method, the towels (usually of the turkish type) are kept in the ice-water mixture until ready to be placed on the patient.

The cold towel is wrung to get rid of excess water, wrapped around the injured part, in the case of muscle or other soft tissue injuries to larger areas, is placed upon the entire injured area. In the latter instance, the whole muscle from promimal to distal attachment should be covered. The ice towels should be frequently changed during the treatment.

One advantage of the ice towel method is that the injured part may be exercised while the cold applications are in place.

THE ICE MASSAGE METHOD (Cryokinetics) was first reported extensively by Hayden and later by Grant. The injured area is massaged with ice in the form of an ice ball or cube. The simplest mode of application via this method, as first suggested by Hayden and Grant, is to make ice in small cans such as juice or soft drink cans. The present authors have employed paper cups to make the ice and have found this to be a satisfactory method. The injured part and the surrounding area is massaged with the ice until the patient reports local numbness or analgesia. Initially the patient will experience a sensation of cold which becomes increasingly uncomfortable followed by an aching sensation. The ice massage should be continued until analgesia is reported. This usually takes from five to ten minutes and varies with the area and type of tissue being treated. It is important to remember that the massaging action should be gentle. Voluntary resistive exercise routines are instituted after the patient experiences analgesia.

The advantages of the ice massage technique of ice application include (1) the availability of materials, (2) little or no financial outlay, (3) ease of application, and (4) adaptation of self and home treatment which leaves the trainer or therapist free to administer therapeutic exercises.

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*This article originally appeared in the Journal of the National Athletic Trainers' Association 2: 6, 1967 and is reprinted by permission of the N.A.T.A. Journal Committee Chairman. The article was written by R.J. Moore, Jr., N. Nicolette, and R. Behnke.

THE ICE IMMERSION TECHNIQUE. The injured part is simply immersed in a solution of ice and water until the patient experiences analgesia or more commonly as long as the patient can tolerate it, (usually a few seconds). This technique, however, can be used only for injuries of the distal joints such as knees, ankles, elbows and hands. Another disadvantage of this technique is its extreme discomfort. The majority of patients treated in this manner find prolonged immersion in the ice a painful experience. Therefore, short periods of immersion before each exercise bout are recommended.

THE ICE BLANKET OR PACK TECHNIQUE can be used with success especially when therapist time is limited. The injured area is covered with a blanket or pack made by putting a layer of crushed ice or shaved ice between two turkish type towels. The ice pack should remain on the patient for fifteen to thirty minutes. The technique is especially useful in severe injuries where pain and/or edema are significant problems. Therapeutic exercises are initiated, if indicated, after the ice pack is removed or can be administered while the pack is in place.

The ice towel, ice massage, and ice blanket techniques of cold application seem to produce the most satisfactory results. The ice towel method requires special equipment but is more suited to the treatment of larger areas, i.e., back, thighs, etc. and as previously mentioned offers the advantage of being able to exercise the injured part during the ice application.

The ice massage method is more economical in terms of amount of time and material required for treatment and adapts well to the athletic situation where one may be treating a large number of injuries. The ice blanket technique has the advantage of both of the above methods and is especially useful in severe injuries.

Exercise Techniques

Immediately after or during the ice application, depending on the technique of application, voluntary resistive exercise routines are initiated. Therapeutic exercise is of paramount importance to the success of cryotherapy, without exercise the effect of this technique is seriously diminished. The cold application in effect, prepares the injured area for exercise. Any of the many exercise techniques may be used with success in conjunction with ice therapy. The authors however, basically follow the techniques first introduced by Kabat and Knott and later perfected and taught by Knott and her co-workers. This technique will not be described in detail here. However, certain basic principles should be followed when employing the selected exercise technique.

BASIC PRINCIPLES. The following guidelines and principles should be followed when approaching any injury.

1. All motions should be voluntary and active.

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2. Maximal resistance is applied to the part being treated. It is important to understand that maximal resistance refers to that resistance which will allow the patient to move pain free through the available range of motion or that resistance which the patient can equal in the case when isometric exercises are used. Resistance must be to patient tolerance and not based on the strength of the trainer or therapist.

3. Any motion that causes pain or any part of the range of motion that is painful is avoided. If the patient experiences pain the injured area may go into spasm, thus defeating one of the purposes of the ice applications - relaxation.

4. The rotatory components of joints and muscle groups are stressed in each exercise routine. If one analyzes each joint kinesiologically one discovers the importance of the rotatory component in the integrity of each joint.

5. Whenever possible, spiral and diagonal patterns of motion, rather than the traditional linear patterns are used in the exercise routines. In this way, all of the components of each muscle and joint are rehabilitated more efficiently. When one examines any athletic event it becomes apparent that few, if any, linear motions are made.

6. An injured area should be relaxed before stretching is done. Relaxation is achieved through the use of isometric exercises and ice applications.

Physiological Effects of Cold Application

The physiological effects of cold have been studied for many years and the literature in this area is vast. However, the effects of cold as used in the techniques described are not clear. A review of the literature reveals a lack of research findings concerning the physiological effects of cold as used in ice therapy.

The authors feel the physiological processes involved include an anaesthetic effect, the raising of the threshold of the muscle spindle, thereby decreasing the spasticity that usually accompanies injury, and an increase in circulation in the involved areas. It is in this last area that the physiologic mechanisms are unclear.

The anaesthetic effect of cold applications has been substantiated by the work of Kraus and Travell.

Newton and Lehmkuhl have shown that the threshold of the muscle spindle is raised by body or muscle cooling. They found the frequency of action potential firing was decreased during a 10^{o} reduction in muscle temperature.

Mead and Knott have recently reviewed the subject of cryotherapy and point out that the literature in this area is sparse. They feel that the anaesthesia of superficial nerves produced by local application of cold is one factor involved in the success of cryotherapy techniques.

Fox, in his review of the effects of local cooling in man, cites Lewis' discovery of vasodilation response to cooling in certain areas of the body. However, the study of Lewis and others reviewed by Fox seem inconclusive. Downey also reviewed several studies that have reported a cold induced vasodilation. He points out, however, that these responses are not fully understood.

Additional specific research is necessary to provide a working physiological model of the effects of cryotherapy.

Need More Research on Physiological Aspects of Cryotherapy

The method of treatment of athletic injuries described above has been used with considerable success. The authors have reviewed many research reports on the effects of cold applications on nervous and circulatory activity and have been unable to find applicable evidence to give an adequate physiological rationale for cryotherapy.

The present authors feel, on the basis of available research and clinical observation, that the mechanisms involved include superficial anaesthesia, depression of the stretch reflex mechanism and an increase in circulation to the injured area. It is clear, however, that cryotherapy permits earlier initiation of therapeutic exercises. Competent investigation of the physiological basis of cryotherapy is sorely needed to answer the many questions raised by present authors and others.

We must, therefore, for the present, rely on the clinical evidence available which gives considerable support to the effectiveness of this technique. The prime concern of the clinician is the safe and speedy recovery of the patient. Cryotherapy, in the opinion of the authors, meets these criteria.

Clinical Effects of Cold Application

Mead and Knott reported success in reducing spasticity by the use of cold applications in such conditions as quadriplegia, arthritis and poliomyelitis. Viel studied the effects of cold applications. He found that patients suffering from cerebral vascular accidents, multiple sclerosis and traumatic quadriplegia experienced relief from spasticity of the finger, wrist and ankle flexor muscle groups after cold applications. Knott and Barafaldi found cold applications to be of benefit in the treatment of cervical sprains (whiplash injuries).

Showman and Wedlick concluded, as a result of their two year study of the effects of cold on the relief of muscle spasm, that application of cold combined with specific exercise techniques is an effective measure in the treatment of multiple sclerosis, traumatic conditions and in the mobilization of stiff joints.

Hayden reported the early results of a program of treatment of acute and painful musculoskeletal conditions with ice massage. In Hayden's program 1000 patients were treated by an ice massage method. Eight hundred and fifty of the patients returned to military duty within one hour after treatment. Only three of this number required an advanced form of treatment.

Grant later reported a continuation of Hayden's preliminary work. He found that of 7000 patients treated with ice massage method, over 80 per cent achieved a rapid and "satisfactory" result. He states that "these results have been achieved in over 80 per cent of the patients with no more than three formal treatments, with less than five per cent of the patients requiring more than six treatments."

Knott has used cold applications with success in the treatment of rheumatoid arthritis. Juvenal has reported success in using Grant's method of ice massage in the treatment of athletic injuries.

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Part 3 Terminology and Preparation for Emergencies

I. Terminology

A. Exposed Wounds

1. Abrasion: Scrap involving the first layers of skin.

a. Immediate Treatment

b. Precautions: Infection

Do Not Let Scab Form

2. Laceration: Jagged or smooth edged wound.

a. Immediate Treatment

b. Precautions: Suturing

3. Puncture: Penetrating wound.

a. Immediate Treatment

b. Precautions: Tetanus

B. Unexposed Wounds

1. Contusion: Bruise.

a. Immediate Treatment

b. Precautions: Myositis Ossificans

2. Strain: Injury to a muscle or its tendinous attachments.

a. Signs and Symptoms

b. Three Degrees of Severity

(1) First Degree (Mild)

(2) Second Degree (Moderate)

(3) Third Degree (Severe)

c. Muscles Commonly Involved

d. Immediate Treatment

e. Precautions: Athlete Prone to Re-injury

3. Sprain: Injury to the connective tissue around a joint.

a. Signs and Symptoms

b. Three Degrees of Severity

(1) First Degree (Mild)

(2) Second Degree (Moderate)

(3) Third Degree (Severe)

c. Joints Commonly Involved

d. Immediate Treatment

e. Precautions: The "Loose Jointed" Athlete

4. Fracture: Interruption in the continuity of a bone.

a. Signs and Symptoms

b. Immediate Treatment

(1) Closed Fracture

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(2) Open Fracture

c. Splinting

d. Precautions: Contamination Of The Open Fracture

The "Tight Jointed" Athlete

5. Dislocation

a. Signs and Symptoms

(1) Luxation

(2) Subluxation

b. Immediate Treatment

c. Splinting

d. Joints Commonly Involved

e. Precautions: Nerve and Blood Vessel Damage

C. Conditions Requiring Immediate First Aid

1. Hemorrhage: Escape of blood.

a. Three Types

(1) Arterial

(2) Venous

(3) Capillary

b. Immediate Treatment

(1) Compression + Elevation

(2) Pressure Points

c. Precautions: Tourniquet

Internal Bleeding

2. Shock: A diminished amount of blood is available which results in death of the tissues from oxygen starvation.

   a. Contributing Factors

   b. Signs and Symptoms

      (1) Pulse is rapid and weak (normal 72/min.)

      (2) Respiration is shallow and irregular (normal 17/min.)

      (3) Skin is moist and clammy

      (4) Pupils are dilated

      (5) Athlete is sluggish

   c. Immediate Treatment

3. Breathing Problems

   a. Evaluation

      (1) Look at the chest

      (2) Listen

      (3) Feel breath against cheek

b. Maintain Airway

(1) Head Tilt Method

(2) Chin Lift Method

(3) Jaw Lift Method

(4) Artificial Airway

c. Methods of Artificial Ventilation

(1) Mouth to Mouth

(2) Mouth to Nose

d. Precautions: Oral Screw

Artificial Airways

Aspiration Of Vomit

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D. Hyperventilation: Loss of carbon dioxide from the body due to rapid and shallow breathing.

1. CO_2-O_2 Balance

2. Signs and Symptoms

a. Breathing is rapid and shallow and accompanied by loud gasping.

b. Athlete is anxious.

c. Athlete is sweating profusely.

d. Athlete is pale and may be nauseated.

e. Athlete may faint.

f. Athlete may experience a tingling sensation in extremities.

3. Immediate Treatment

a. Breathe into and out of a paper bag or

b. Hold breath or

c. Assume position for mouth to mouth artificial resuscitation

(1) Tilt head back

(2) Elevate shoulders to expand chest cavity - place something under shoulders

d. Reassure the athlete - get her to relax

4. Precautions: Do Not Give Oxygen

II. Preparation for Emergencies

A. Preseason

1. Physical Examination

2. Conditioning

3. Protective Taping

B. Game Day

1. Emergency Equipment

a. Ice and Water

b. Trainer's Kit

c. Splints, Crutches and Stretcher

d. Blankets

2. Secure access to a phone

3. Keep phone numbers in a readily accessible place

4. Have a school car in a readily accessible place

C. Injury Evaluation

1. Mechanism of Injury

2. Medical History

3. Physical Examination

a. What is seen

b. What is felt

c. What is heard

D. Removal From Field

1. Ambulatory Aid - "Seat-of-the-Pants" Carry

2. Stretcher

3. Back Board

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WOMEN'S INTERCOLLEGIATE ATHLETICS
University of Iowa
Medical Information

Sport_____

Name_____ Soc. Sec. No._____
Last First Middle

School Address_____ School Phone_____

Parents' (Guardian) Name_____ Phone_____

Street Address_____ City, State_____

Parents' Accident Insurance Company_____

Policy Number_____

Would your parents' insurance cover you in intercollegiates? _____yes_____no
Supplemental Student Health Insurance _____yes_____no

Medical Information:

Do you wear glasses? _____ contact lenses? _____

Are you taking any medication regularly? _____ If so, for what condition(s)?
_____What are they?_____
_____

How long have you been taking it?_____

Are you allergic to any medicine? _____ If so, what are they?_____
_____

Do you have any other allergies (insects, food, etc.)?_____
_____

Do you have diabetes? _____ Epilepsy? _____

Have you had rheumatic fever? _____

Head injuries? _____ How many times?_____
Ever unconscious? _____ If so, for how long?_____
Hospitalized for head injury? _____ If so, for how long?_____

Circle any of the following body areas which you may have injured so as to cause you to miss a practice and/or a game.

1. Neck
2. Shoulder
3. Upper Arm
4. Elbow
5. Lower Arm
6. Wrist
7. Hand
8. Fingers
9. Spine (Back)
10. Ribs
11. Pelvis
12. Hip
13. Thigh
14. Knee
15. Lower Leg
16. Ankle
17. Foot
18. Toes
19. Pulled Hamstring
20. Bruised Thigh
21. Pinched Nerve
22. Chipped or Lost Tooth
23. Shin Splints

Fill in the blanks below with the number(s) of the areas you have circled above.

Broken bones_____ Surgery_____

Dislocated bones_____ Hospitalized (list how long)

_____

Sprained ligaments_____ _____

Torn or bruised muscles_____ Plaster casts_____

Crutches_____

List any other injuries or ailments which we have not covered.

_____

_____

List any injuries (ankle sprains, knee sprains, pulled muscles, etc.) that you have had in the last 12 months. _____

_____

_____

_____

Comments:

Date_____ Signature_____

STUDENT HEALTH SERVICES
THE UNIVERSITY OF IOWA
IOWA CITY, IOWA 52242

67

REPORT OF HEALTH EVALUATION

TO THE EXAMINING PHYSICIAN: Please review the student's history and complete the physician's form. Please comment on all positive answers. The information supplied will not affect his/her status: it will be used only as a background for providing health care, if this is necessary. This information is strictly for the use of the Health Services and will not be released without student consent.

SEX: M ☐ F ☐

LAST NAME FIRST NAME MIDDLE

BP /

Student's Social Security Number

Corrected Vision
Right 20/ Left 20/

Height inches Weight lbs.

URINALYSIS

Sugar _____

Albumin _____

Micro. _____

_____

IMMUNIZATION

	Completed		Date of Last Injection
	Yes	No	
Tetanus			
Smallpox			
Polio			
Measles			

Tuberculin Skin Test: Positive _____ Negative _____

Chest X-ray: Positive _____ Negative _____

Are there abnormalities of the following systems? Describe fully. Use reverse side of sheet if needed.

	Yes	No
1. Head, Ears, Nose or Throat		
2. Respiratory		
3. Cardiovascular		
4. Gastrointestinal		
5. Hernia		
6. Eyes		
7. Genitourinary		
8. Musculoskeletal		
9. Metabolic/Endocrine		
10. Neuropsychiatric		
11. Skin		

Is there loss or seriously impaired function of any paired organ? _____ Yes _____ No

Have you any general comments?

Recommendations for physical activity (PE, Intramurals, ROTC) Unlimited _____ Limited _____ Explain:

Do you have any recommendations regarding the care of this student? Yes ___ No ___

Is the patient now under treatment for any medical or emotional condition? Yes ___ No ___

PHYSICIAN'S SIGNATURE _____

ADDRESS _____

PRINT LAST NAME _____ DATE _____

Return all information to:
DIRECTOR, STUDENT HEALTH SERVICE
Children's Hospital Building
THE UNIVERSITY OF IOWA
IOWA CITY, IOWA 52242

Form 4

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2206

TRAINER'S KIT

Item	Necessity
Antibiotic Ointment	
First Aid Cream	X
Alcohol or substitute	X
Green Soap or substitute	X
Vaseline or substitute	X
Analgesic - mild	X
Analgesic - hot	
Hydrogen Peroxide	X
Aspirin	X
Antacid Tablets	
Kaopectate	
Elastic Wraps - 2"	
Elastic Wraps - 3"	
Elastic Wraps - 4"	X
Sterile Gauze - 4X4	X
Sterile Gauze - 3X3	X
Bandaids - 1X3	X
Bandaids - Extra Large	X
Gauze Sponges	X
Bandage Scissors	X
Tape Cutter	X
Tweezers	X
Nail Clippers	X
Nail File	
Cuticle Scissors	
Hand Mirror	X
Tongue Depressors - Juniors	X
Cotton-tipped Applicators	X
Dental Plugs	
Resusitube	X
Flashlight - penlight	X
Ammonia Capsules	
Needle and Thread	X
Safety Pins	X
Rubber Bands	X
Tampax or substitute	X
Vinyl Foam	X
Combine	X
Sling	X
Heel Cup	

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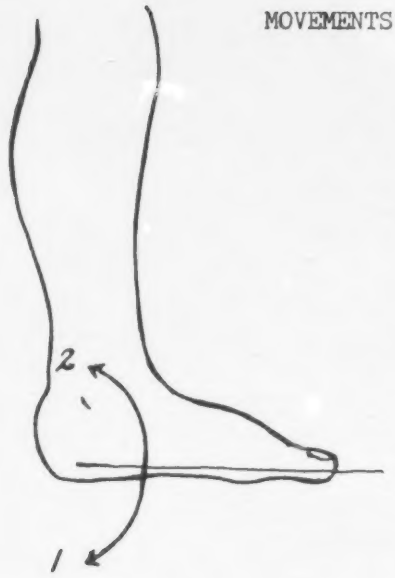
TAPE KIT

Item	Necessity	
Athletic Tape - 1½"	X	
Athletic Tape - 1"		
Elastic Tape - 1"		
Elastic Tape - 1½"		
Elastic Tape - 2"		
Clear Plastic Tape - ½"		
Clear Plastic Tape - 1"		
Underwrap - foam	X	
Underwrap - gauze rolls	X	Carry at least one type
Underwrap - gauze sponges	X	of underwrap
Gauze Sponges (nonsterile)	X	
Gauze Rolls (nonsterile)	X	
Tape Adherent	X	
Tape Remover	X	
Tape Cutter	X	
Bandage Scissors	X	
Chemical Cold Packs	X	

Emergency Equipment

Splints - air, cardboard or ladder
Stretcher
Blankets
Towels
Ice Jug - full of ice and ice packs

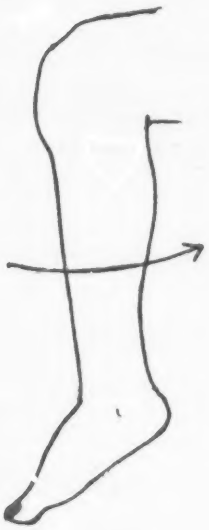
MOVEMENTS OF THE FOOT



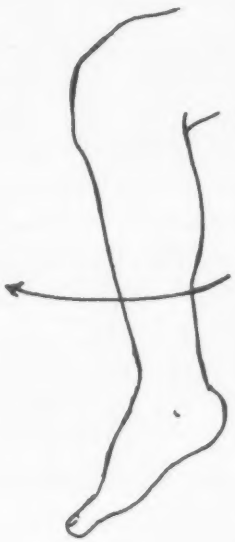
1. Plantar Flexion
2. Dorsal Flexion

1. Eversion (sole turned outward)
2. Inversion (sole turned inward)

MOVEMENTS OF THE KNEE

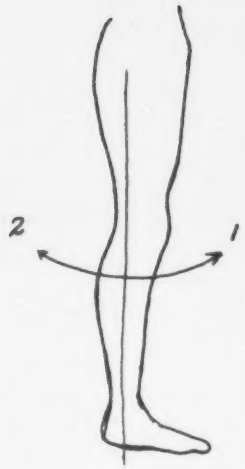


Flexion



Extension

MOVEMENTS OF THE HIP

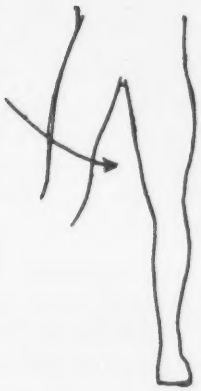


1. Flexion
2. Extension

Outward Rotation

Inward Rotation

Abduction



Adduction

MOVEMENTS OF THE SHOULDER

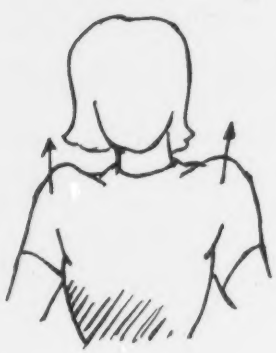
1. Extension
2. Flexion

1. Abduction
2. Adduction

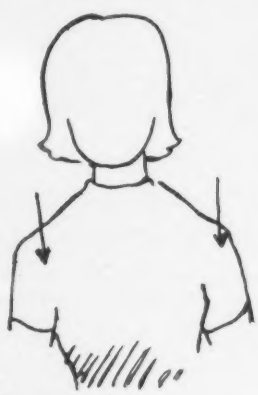
Inward Rotation

Outward Rotation

Circumduction



Elevation



Depression

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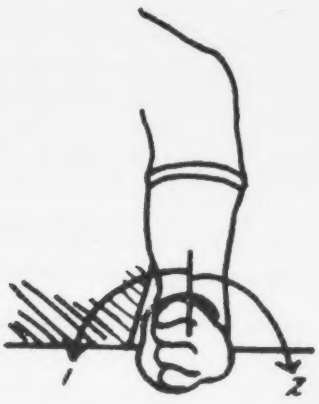
MOVEMENTS OF THE ELBOW

Flexion

Extension

MOVEMENTS OF THE HAND



1. Pronation (palm down)
2. Supination (palm up)

Flexion

Extension

Part 4 Specific Injuries

I. The Foot - blisters, athlete's foot, plantar warts

A. Blisters: Friction burns.

1. Causes

a. Shoes

b. Socks

c. Calluses

2. Treatment

a. Conservative

b. Puncturing

c. Radical

d. Calluses

3. Prevention

a. Feet

(1) Lubricant

(2) "Hot Spot"

b. Shoes

(1) Fit

(2) Proper Lacing

(3) Breaking In New Shoes

(4) Innersoles

c. Socks

(1) Fit

(2) Eliminating Wetness

(a) Wool Socks

(b) Foot Powder

(3) Eliminating Roughness

(a) Tube Socks

(b) Wrong Side Out

(c) Clean Socks

(4) Two Pair of Socks

(5) Bar Soap

d. Calluses

(1) File Smooth

(2) Keep Moist

B. Athlete's Foot

Note: Athlete's foot is <u>not</u> extremely contagious. The athlete must be susceptible to the fungus to be infected.

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1. Treatment

2. Prevention

C. Plantar Warts

Note: Plantar warts are caused by a virus. Only those athletes who are sensitive to the virus will get plantar warts.

1. Treatment

2. Prevention

a. Short Term Cases (less than 6 months old)

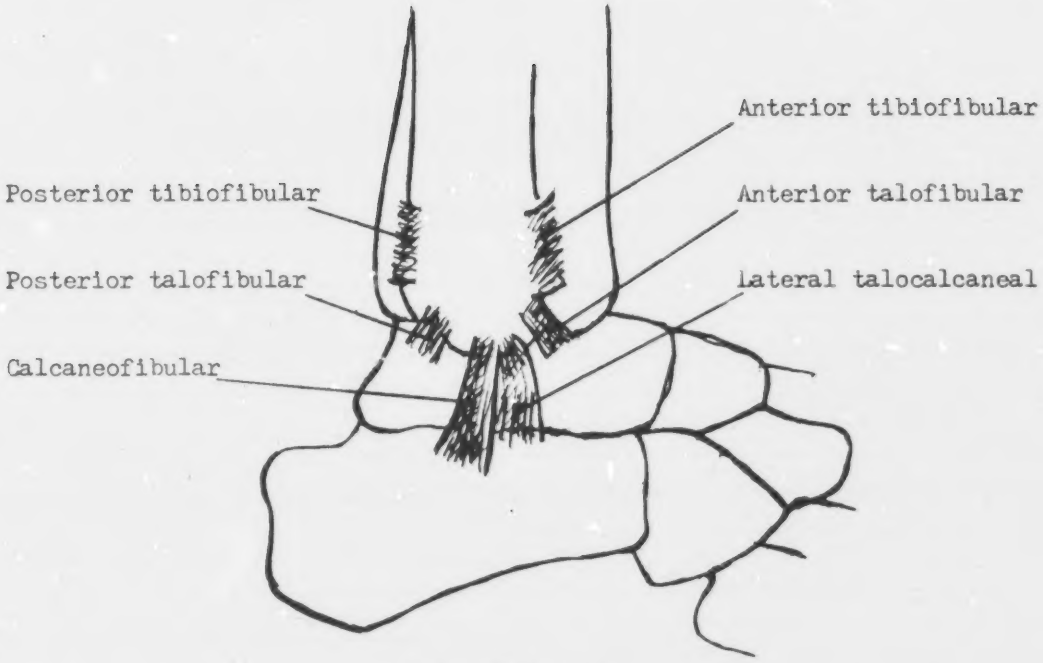
b. Long Term Clusters

II. The Ankle - sprain

A. Anatomy

1. Hinge Joint

LIGAMENTS OF THE ANKLE



Lateral Aspect

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2. Bony Structure

3. Ligamentous Structure

a. Anterior Talofibular
b. Calcaneofibular
c. Posterior Talofibular

} Lateral Aspect

d. Deltoid

B. Mechanism of Injury

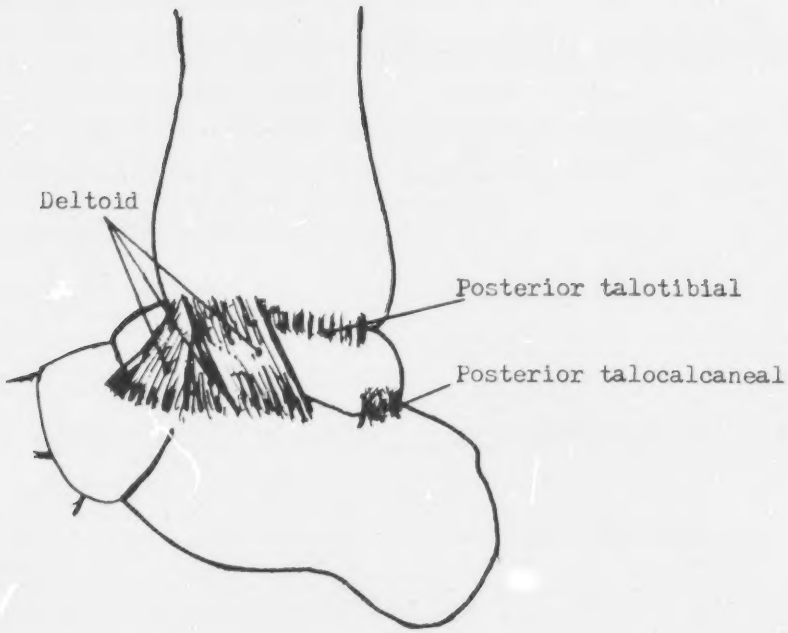
1. Inversion Sprain

2. Eversion Sprain

C. Field Examination - Compare the injured ankle with the non-injured one.

1. Shaft of the Fibula

LIGAMENTS OF THE ANKLE



Medial Aspect

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2. Border of the Malleolus

3. Ligaments - Lateral Side

4. Achilles Tendon

5. Peroneal Tendons

6. Deltoid Ligament

7. Fifth Metatarsal

8. Range of Motion

9. Drawer Test

D. Immediate Treatment

1. Ice, Compression, Elevation (ICE) or

2. Ice Slush

3. X-ray

4. Open Basketweave

E. Rehabilitation

1. Ice Massage

2. Infra-red

3. Hydrocollator Pack

4. Ultrasound

5. Whirlpool

6. Range of Motion Exercises

7. Strengthening Exercises

8. Closed Basketweave

F. Criteria for Return

1. Figure 8's

2. Cut - Right and Left

3. Full Range of Motion

4. No Pain

5. Physician's Approval

G. Prevention

1. Preseason Conditioning

2. Lacing of Shoes

3. Cloth Ankle Wrap

4. High-top Tennis Shoes

5. Shoes with Good Arch Supports

6. Closed Basketweave

H. Strapping

1. Closed Basketweave

2. Open Basketweave

3. Cloth Ankle Wrap

III. The Achilles Tendon - strain

A. Mechanism of Injury

B. Field Examination

1. Range of Motion

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2. Gastrocnemius

3. Line of Tendon

4. Indentation

C. Immediate Treatment

1. ICE

2. Strapping to Prevent Excessive Dorsal Flexion

3. Heel Lift

D. Rehabilitation

1. Ice Massage

2. Modalities

3. Range of Motion Exercises

a. Gastrocnemius Stretch

b. Half Squat

4. Strengthening Exercises

a. Toe Rises

b. Jogging

c. Bicycling

IV. The Arch - strain

A. Anatomy

1. Bony Structure

a. Tarsals

b. Metatarsals

c. Phalanges

2. Arches

a. Inner Longitudinal

b. Outer Longitudinal

c. Metatarsal

d. Transverse

3. Muscular Structure

a. Plantar Flexors

(1) Gastrocnemius (Posterior Aspect: Femur - Calcaneous)

(2) Soleus (Posterior Aspect: Tibia & Fibula - Calcaneous)

(3) Peroneus Longus (Lateral Aspect: Fibula - 1st Metatarsal)

(4) Peroneus Brevis (Lateral Aspect: Fibula - 5th Metatarsal)

(5) Tibialis Posterior (Medial Aspect: Interosseous Membrane - Navicular)

b. Dorsal Flexors

(1) Tibialis Anterior (Medial Aspect: Tibia - 1st Metatarsal)

(2) Extensor Digitorum Longus (Anterior Aspect: Fibula - 2nd-5th Phalanges)

(3) Extensor Hallucis Longus (Anterior Aspect: Fibula - 1st Phalanx)

(4) Peroneus Tertius (Anterior Aspect: Fibula & Interosseous Membrane - 5th Metatarsal)

c. Invertors

(1) Tibialis Anterior

(2) Tibialis Posterior

d. Evertors

(1) Peroneus Longus

(2) Peroneus Brevis

(3) Peroneus Tertius

B. Causes

C. Symptoms

1. First Degree (Mild)

2. Second Degree (Moderate)

3. Third Degree (Severe)

D. Treatment

1. Shoes

2. Arch Supports

a. Longitudinal

b. Metatarsal

3. Strapping

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E. Rehabilitation

1. Toe Curls

2. Marble Pick-up

3. Toe Rises

4. Gastrocnemius Stretch - toes turned in slightly

5. Isometrics

   a. Plantar Flexion

   b. Dorsal Flexion

   c. Inversion

   d. Eversion

Note: Eliminate toe rises and the plantar flexion isometric during the acute stages. Avoid additional stress on the arches.

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V. The Lower Leg - shin splints

A. Definition - "Pain and discomfort in leg from repetitive running on hard surface or forcible excessive use of foot flexors; diagnosis should be limited to musculotendinous inflammations, excluding fatigue fracture or ischemic disorder."[1]

B. Cause - Unknown

1. Playing Surface

2. Weak Arches

3. Shoes

4. Muscle Imbalance

5. Fatigue - "Too Much Too Soon"

6. Running Mechanics

C. Progressive Theory

1. Muscle Strain

2. Interosseous Membrane

---

[1]AMA, Standard Nomenclature of Athletic Injuries (Chicago, Illinois, 1966), p. 126.

3. Periosteum

4. Stress Fracture

D. Rehabilitation

1. Ice Massage

2. Analgesic Pack

3. Hydrocollator Pack

4. Arch Exercises

Note: Eliminate toe rises and the plantar flexion isometric during the acute stages. Avoid additional stress on the arches.

5. Running Mechanics

E. Prevention

1. Jogging

2. Conditioning

a. Isometric Exercises

b. Gastrocnemius Stretch

c. Running Mechanics

3. Shoes

F. Strapping

1. Arch

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a. Arch Pads

(1) Longitudinal

(2) Metatarsal

b. Heel Lift

2. Front of Shin

VI. The Knee - sprain, dislocated patella, bursitis

A. Anatomy

1. Hinge Joint

a. Flexion

b. Extension

c. Rotation

2. Ligaments

a. Lateral Collateral

b. Medial Collateral

(1) Superficial Attachment

(2) Deep Attachment

c. Cruciate

(1) Anterior

(2) Posterior

3. Cartilage

a. Medial - Attached to the medial collateral ligament.

b. Lateral

4. Bursae

a. Infrapatellar (Between the lower portion of the patellar ligament and the tibia)

b. Prepatellar (In front of the patella)

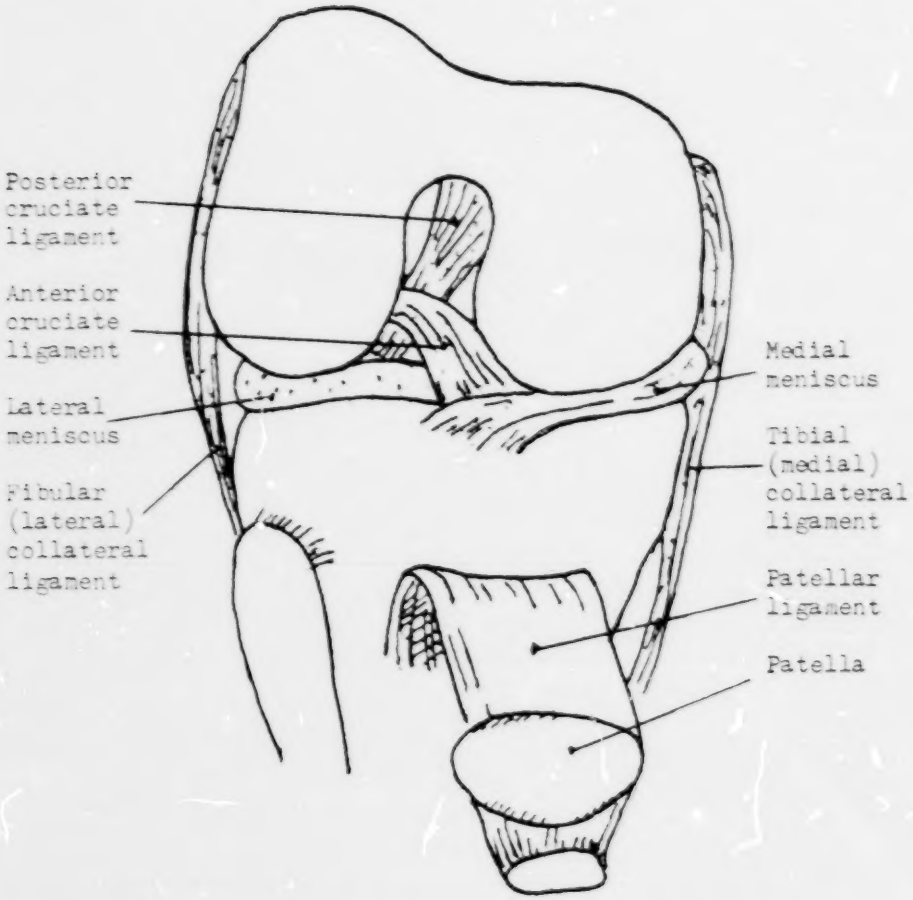
c. Pretibial (Over the tibial tubercle)

d. Popliteal

5. Muscle Structure

a. Quadriceps

LIGAMENTS OF THE KNEE



Anterior Aspect

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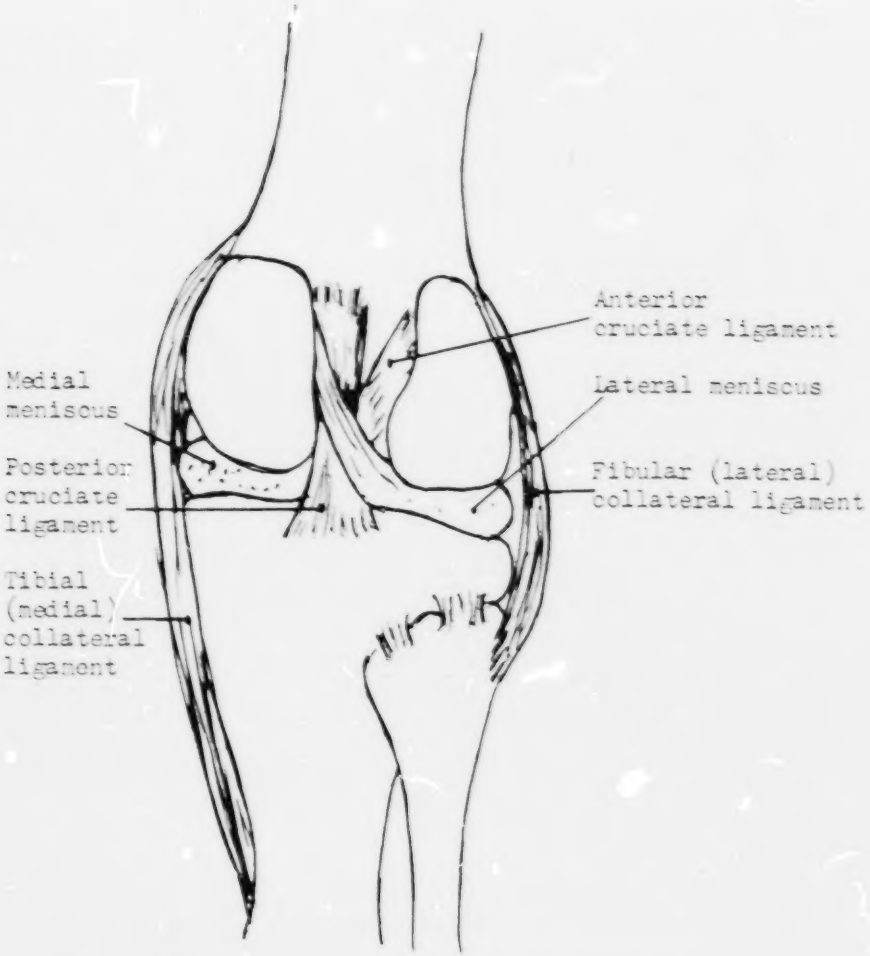
LIGAMENTS OF THE KNEE



Posterior Aspect

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(1) Rectus Femoris (Iliac Crest - Patella)

(2) Vastus Intermedius (Anterior & Lateral Upper Femoral Shaft - Patella)

(3) Vastus Medialis (Femur - Patella)

(4) Vastus Lateralis (Femur - Patella)

b. Hamstrings

(1) Biceps Femoris (Ischial Tuberosity & Femur - Tibia & Fibula)

(2) Semitendinosus (Ischial Tuberosity - Tibia)

(3) Semimembranosus (Ischial Tuberosity - Tibia)

c. Gastrocnemius (Condyles of the Femur - Calcaneous)

B. The Sprained Knee

1. Mechanism of Injury

a. Leverage

(1) Hinge Action

(2) Collateral Ligaments

b. Rotatory Stress

(1) Cruciate Ligaments

(2) Cartilage

2. Field Examination

a. Joint Line

b. Immediately Above and Below Joint Line

c. Three Inches Below Joint Line - Medial Side

d. Pain Within Joint Cavity

e. Range of Motion

(1) Physiological Locking

(2) Psychological Locking

f. Knee Tests

(1) Girth Measurements

(2) Collateral Ligaments

(3) Cruciate Ligaments

g. Toe Walking

3. Removal From Field

a. "Seat-of-the-Pants" Carry

b. Stretcher

4. Immediate Treatment

a. ICE

b. Splint

c. Crutches

d. Physician

5. Rehabilitation

   a. Range of Motion Exercises

   b. Strengthening Exercises - Lift approximately 1/3 of your body weight.

6. Psychological Rehabilitation

7. Criteria for Return

   a. Equal Girth

   b. 2/3 Ratio

   c. Figure 8's

   d. Right Angle Squat for 60 Seconds

   e. 1 Set of 10 Repetitions at 1/3 of the Body Weight

   f. Physician's Approval

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8. Prevention

9. Braces

Note: Braces lose their ability to stabilize the knee as the elastic cuff wears out. The cuff loses its elasticity.

10. Strapping

C. The Dislocated Patella

1. Mechanism of Injury

2. Immediate Treatment

a. Reduction

(1) Flex Hip

(2) Extend Leg

b. ICE

c. Splint

d. Physician

3. Rehabilitation

4. Prevention

D. Prepatellar Bursitis - "Housemaid's Knees"

1. Mechanism of Injury

2. Treatment

a. Compression

b. Ice Massage

c. Modalities

VII. Muscles - contusion, cramp, strain

A. Contusion

1. Cause

2. Muscles Commonly Affected

3. Immediate Treatment

a. ICE

b. Stretch

4. Protective Padding

5. Complications

a. Hematoma

b. Blood Clots

c. Chip Fracture

d. Myositis Ossificans

6. Prevention

a. Protective Equipment

b. Protective Padding

B. Cramps

1. Causes

2. Immediate Treatment

3. Prevention

C. Strains

1. Causes

2. Muscles Commonly Affected

a. Hamstrings

b. Quadriceps

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c. Groin

d. Low Back Extensors

3. Field Examination

a. Range of Motion

(1) Hamstrings

(a) Pain on Straight Leg Lift

(b) Pain on Active Resistance

(2) Quadriceps

(a) 90 Degree Flexion - Mild

(b) Less Than 90 Degree Flexion - Moderate-Severe

(3) Groin

(a) Adductors - Pain on Active Resistance

(b) Iliopsoas - Pain on Hip Flexion

(c) Rectus Femoris - Pain on Knee Extension

(4) Low Back Extensors

(a) Pain on Flexion, Extension, Hyperextension

(b) Pain on Lateral Flexion

b. Trace Path of Muscles

(1) Knots

(2) Indentations

4. Immediate Treatment

a. ICE

b. Stretch

(1) Hamstrings

(2) Quadriceps

c. Compression Bandage

(1) Vinyl Foam

(2) Elastic Wrap

d. Heel Lift - Hamstrings Strain

5. Rehabilitation

a. Ice Massage

b. Analgesic Pack

c. Muscle Stimulator

d. Ultrasound

e. Stretching Exercises

(1) Hamstrings

(2) Quadriceps

(3) Groin

(4) Low Back Extensors

f. Strengthening Exercises

(1) Hamstrings

(2) Quadriceps

(3) Groin

(4) Low Back Extensors

6. Strapping

a. Hamstrings

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b. Quadriceps

c. Groin

d. Low Back

VIII. The Shoulder - anterior dislocation, bicipital tendinitis, bursitis, acromioclavicular sprain

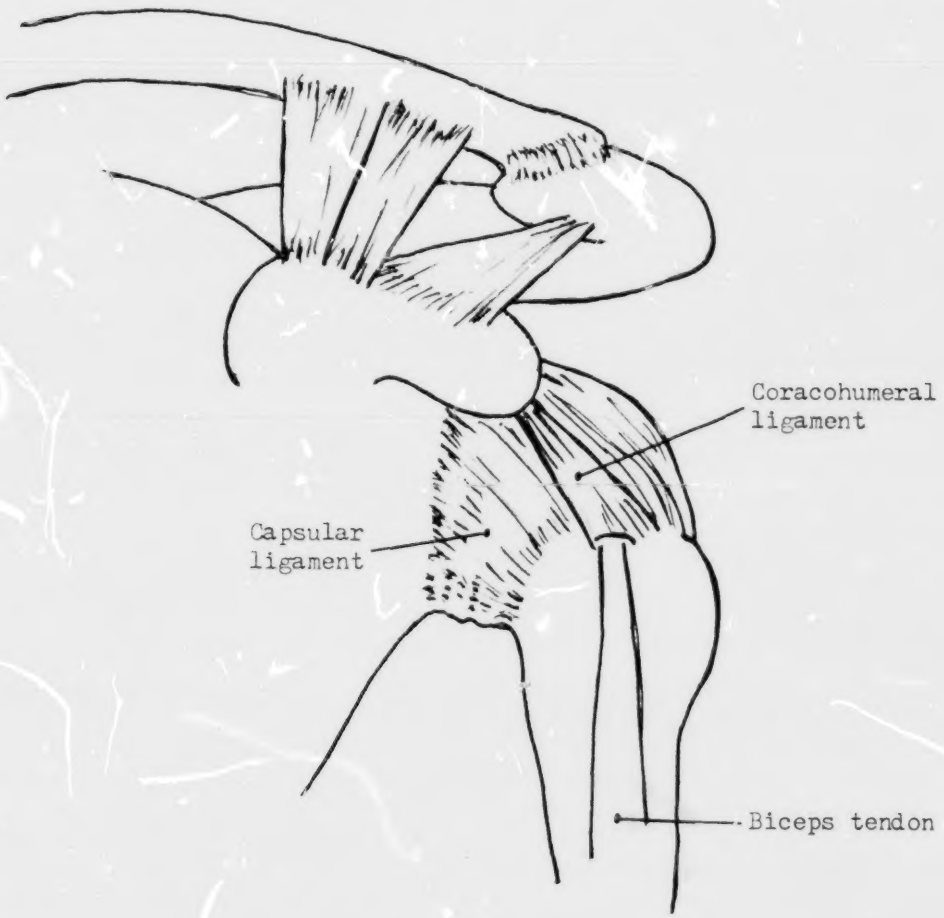
A. Anatomy

1. Joint Structure

a. Sternoclavicular
b. Acromioclavicular
c. Coracoclavicular

} Shoulder Girdle

LIGAMENTS OF THE SHOULDER



Anterior Aspect

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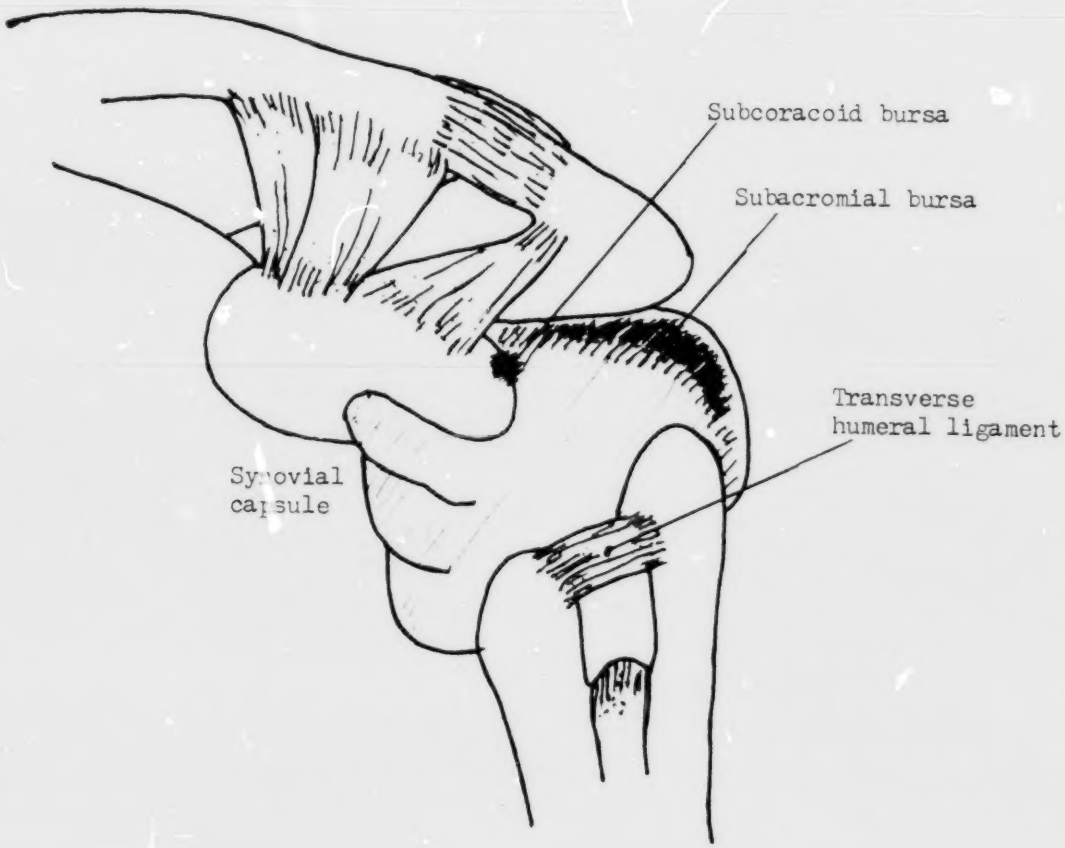
SYNOVIAL CAPSULE AND BURSA OF THE SHOULDER



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d. Glenohumeral

2. Muscular Structure

a. Superficial Muscles (Thorax & Shoulder Girdle - Humerus)

(1) Deltoid - "Shoulder Cap"

(2) Pectoralis Major (Clavical & Ribs - Humerus)

(3) Latissimus Dorsi (Spinal Column - Humerus)

(4) Teres Major (Scapula - Humerus)

b. Deeper Muscles (Scapula - Humeral Head)

(1) Supraspinatus
(2) Infraspinatus
(3) Subscapularis
(4) Teres Minor

} Rotator Cuff

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B. Shoulder Movements

1. Scapulohumeral Rhythm - 2:1 ratio of arm movement to scapular movement.

2. Range of Motion

a. Flexion

b. Extension

c. Abduction

d. Adduction

e. Inward Rotation

f. Outward Rotation

g. Horizontal Abduction

h. Horizontal Adduction

i. Circumduction

j. Elevation

k. Depression

l. Scapular Abduction

m. Scapular Adduction

C. Anterior Dislocation

1. Mechanism of Injury

2. Field Examination

a. Position of Arm

b. Deltoid Contour

c. Range of Motion

3. Immediate Treatment

   a. Ice, Compression

   b. Splint

   c. Physician

4. Rehabilitation

   a. Ice Massage

   b. Analgesic Packs

   c. Infra-red

   d. Hydrocollator

   e. Ultrasound

   f. Range of Motion Exercises

Precautions: Do Not Lift The Arm Above 90 Degrees.

g. Strengthening Exercises

5. Strapping vs. Bracing

D. Bicipital Tendinitis & Bursitis

1. Mechanism of Injury

2. Evaluation

a. Point Tenderness

(1) Bicipital Tendinitis

(2) Bursitis

b. Restricted Range of Motion

(1) Abduction

(2) Outward Rotation

3. Treatment

a. Ice Massage

b. Infra-red

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c. Hydrocollator

d. Ultrasound

e. Range of Motion Exercises

(1) Finger Ladder

(2) Finger Ladder with Knee Bend

(3) Outward Rotation

(4) Internal Rotation Posteriorly - Hammer Lock Position

4. Physician

E. Acromioclavicular Sprain

1. Mechanism of Injury

a. Direct

b. Indirect

2. Field Examination

a. Point Tenderness

b. Deformity

c. Range of Motion

3. Immediate Treatment

a. Ice, Compression

b. Sling

c. Physician

4. Rehabilitation

IX. The Elbow - sprain-strain, dislocation, tennis elbow

A. Anatomy

1. Hinge Joint

2. Muscular Structure

a. Biceps Brachii (Scapula - Radius)

b. Brachialis (Humerus - Ulna)

c. Brachioradialis

d. Triceps (Scapula & Humerus - Olecranon)

B. Mechanism of Injury

1. Sprain-Strain

a. Hyperextension

b. Abnormal Pronation, Supination

2. Dislocation

3. Tennis Elbow

C. Field Examination

1. Sprain-Strain

45 Degree Angle

2. Dislocation

Note: Check for signs of nerve and blood vessel damage.

3. Tennis Elbow

a. Point Tenderness

(1) Lateral Epicondyle

(2) Radiates Down Arm

b. Swelling

c. Pain on Passive Movement

(1) Pronation

(2) Supination

d. Pain on Gripping

D. Immediate Treatment

1. Ice, Compression

2. Splint

3. Sling

4. Physician

E. Rehabilitation

1. Ice Massage

2. Whirlpool

3. Infra-red

4. Hydrocollator

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5. Ultrasound

6. Range of Motion Exercises

7. Strengthening Exercises

F. Strapping

1. Hyperextension

2. Counterbracing - Tennis Elbow

Note: Tennis elbow may require rest and/or correction of stroke mechanics.

X. The Wrist - navicular fracture, sprain

A. Anatomy

1. Bony Structure

2. Range of Motion

B. Mechanism of Injury

1. Navicular Fracture

2. Sprain

C. Field Examination

1. Navicular Fracture

Anatomical Snuffbox

2. Sprain

D. Immediate Treatment

1. ICE

2. Splint

3. Sling

4. Physician

E. Rehabilitation

1. Ice Massage

2. Whirlpool

3. Hydrocollator

4. Ultrasound

5. Range of Motion Exercises

6. Strengthening Exercises

F. Strapping

1. Wrist Strap

2. Figure 8

XI. The Finger - fracture, avulsion fracture, dislocation, sprain

A. Anatomy

B. Mechanism of Injury

C. Field Examination

1. Fracture

2. Chip Fracture

3. Avulsion Fracture

4. Dislocation

5. Sprain

D. Immediate Treatment

1. Ice, Compression or

2. Ice Slush

3. Splint

a. Proximal & Middle Fractures

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b. Distal Fractures

c. Avulsion Fractures of the Extensor Tendon

4. Reduction of a Dislocation (excluding the thumb)

5. Physician

E. Rehabilitation

1. Ice Slush

2. Whirlpool

3. Range of Motion Exercises

4. Strengthening Exercises

F. Strapping

1. Tongue Depressor Splint

2. Two Fingers Together

3. Thumb

4. Gymnastics Rips

XIII. The Head - concussion, scalp wounds, black eye, nose bleed, contact lenses, detached retina

A. Concussion - Slow Reacting Injury

1. Mechanism of Injury

a. Direct

b. Indirect

2. Signs and Symptoms

a. First Degree - "Shook Up"

b. Second Degree (Moderate)

Note: Physician decides if the athlete may return to competition.

c. Third Degree (Severe)

3. Rating Scale

a. Can the athlete talk and make sense?

Ask questions that require 1 - 2 word answers.

b. How does the athlete talk in terms of a sentence?

c. Does the athlete respond to only shaking and shouting?

d. Does the athlete respond appropriately to checks of feel?

(1) Grip Strength

(2) Pinch, Pull Hair

(3) Movement

e. Do the pupils constrict in response to light?

f. Does the athlete respond appropriately to neurological tests?

(1) Romberg

(2) Touch Nose

(3) Touch Fingers Together

(4) Walk in Straight Line

4. Immediate Treatment

a. Evaluate

b. Ice Pack

c. Ammonia Capsule

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d. Maintain Airway

5. Precautions: No Participation -

Unconscious more than 10 seconds

Colors or stars

Numbness or paralysis

Dizzy

Slow Reacting Injury

No Medication

B. Scalp Wound

1. Immediate Treatment

a. Cleaning

Note: Avoid excessive pressure on wound to control bleeding. It could result in an increase in intracranial pressure.

b. Suturing

C. Black Eye

1. Immediate Treatment

2. Precautions: Orbital Fractures

Visual Problems

Note: Do not blow nose following an acute eye injury for it may increase capillary bleeding.

D. Nose Bleed

1. Position of Athlete

2. Immediate Treatment

a. Pinch Nostrils - 5 Minutes

b. Apply Astringent

c. Insert Cotton Plug

E. Contact Lenses

F. Detached Retina

XIV. Heat Stress - heat cramps, heat exhaustion, heat stroke

A. Environmental Factors

1. Temperature

2. Humidity

B. Body Cooling Mechanism - Sweating

C. Cause

1. Prolonged Sweating

2. Inadequate Replacement of Salt, Water and Potassium

D. Prevention

1. Acclimatization

2. Proper Clothing

3. Frequent Water Breaks

4. Rest Periods

5. Sling Psychrometer

E. Signs and Symptoms - Progressive Disorder

1. Heat Cramps

2. Heat Exhaustion

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3. Heat Stroke

F. Treatment

1. Heat Cramps and Heat Exhaustion

2. Heat Stroke

Note: The individual's body temperature must be returned to normal within 15-20 minutes or death may occur.

C. Replacement of Salt

1. Commercial Salt Solutions

2. Homemade Substitute

   a. 1 gal. water

   b. 1½ packages Kool Aid

   c. 1½ cups sugar

   d. 1 tsp. salt

   Note: Potassium may be as important, if not more important, than salt to replace. Add 1 pint of white molasses to 5 gal. of salt solution.

3. Salt Tablets vs. Salt Solution

References

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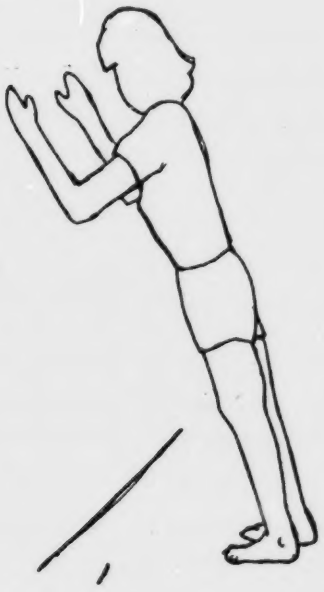
Bob Shelton

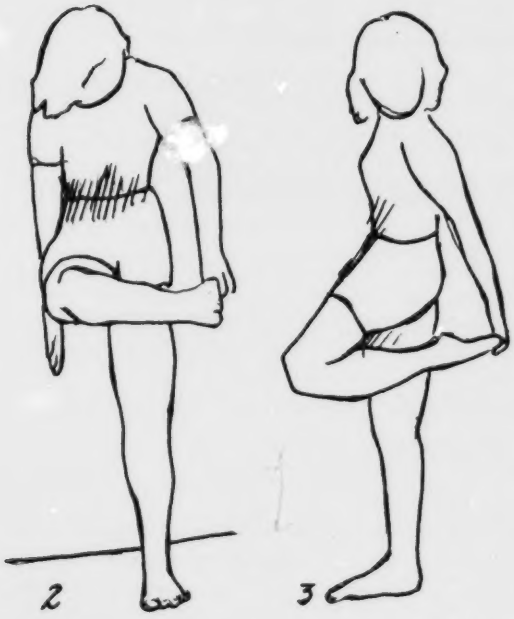
THERAPEUTIC EXERCISES FOR ANKLE AND FOOT DISABILITIES



1. Heel Cord (Achilles Tendon) Stretch
   Stand 30 inches from wall with the arms extended in front of the body and palms flat on the wall. Bend the elbows so the body leans into the wall. Keep the heels flat on the floor. Repeat 10 times.

2. Inversion Exercise
   Pick up wad of paper with toes and place in hand as shown. Repeat 10 to 15 times. Repeat with other foot.

3. Eversion Exercise
   Pick up wad of paper with toes and place in hand as shown. Repeat 10 to 15 times. Repeat with other foot.



4. Toe Flexor Exercise
   In a sitting position, place the feet on end of towel. Pull towel under feet with toes. Weight may be placed on towel to increase resistance. Repeat 4 to 5 times.

5. Plantar-Flexion Exercise
   Raise up and down on toes holding a weight in each hand to increase resistance. Repeat 3 bouts of 10 repetitions each using the maximum weight that can be held. (A press-bar may be substituted.)

Bout - ten successive repetitions.
Repetition - one complete movement up and down.
R.M. - maximum weight which can be lifted consecutively for 10 repetitions.

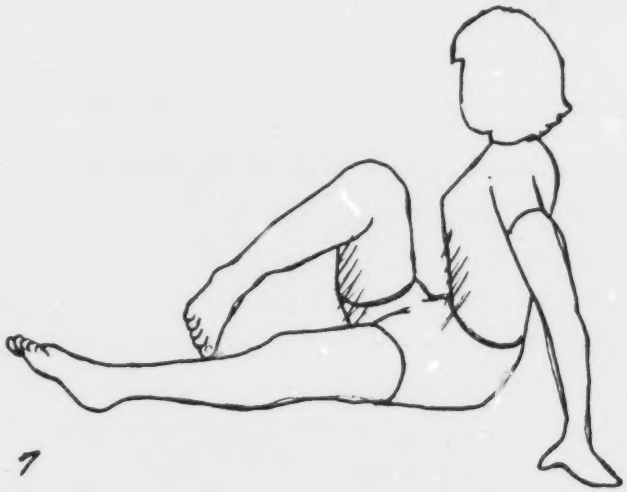
4

6. Inversion - Toe Flexion Exercise
Walk 10 to 30 yards on sides of the feet with the toes curled inward.

7. Supinator (Inversion - Plantar-Flexion)
In a sitting position estend one leg. Slowly bring the opposite foot up the shin of the straight leg as far as possible. Use the big toe as a pointer.

30 repetitions per day, 3 to 5 times per week are sufficient. After maximum strength is obtained, one to two periods per week will maintain strength.

5



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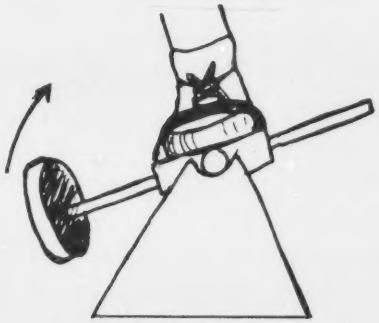
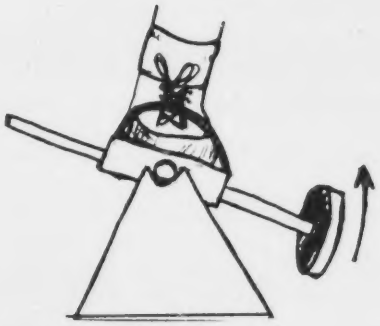
Bob Shelton
Gene Logan

THERAPEUTIC EXERCISE FOR ANKLE DISABILITIES

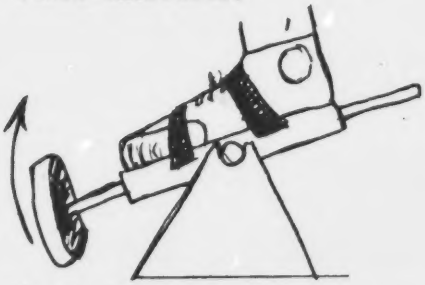


1. Eversion - pull as indicated. Repeat 3 R.M.'s* after weight load has been established (based on muscle tolerance). Increase weight as tolerated but keep weight maximum. Raise and lower weight slowly.

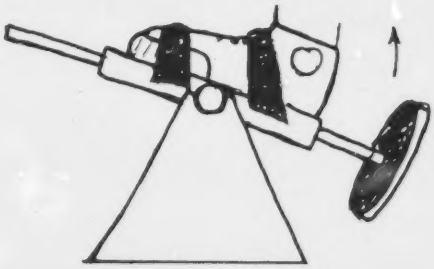
   Repeat this procedure in the other exercises.



2. Inversion - pull up as indicated.

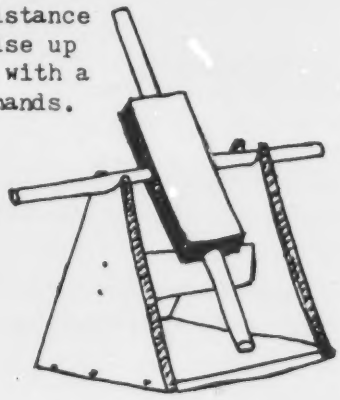


3. Dorsi-Flexion - pull up as indicated.



4. Plantar-Flexion - pull up as indicated.

   Due to the normally tremendous strength of the muscle group involved in this movement, great resistance must be applied. Rise up and down on tiptoes with a weight held in the hands.



*R.M. - Maximum weight which can be lifted consecutively for 10 repetitions.

Three R.M.'s per day, 3 to 5 times per week are sufficient. After maximum strength is obtained, one to two periods per week will maintain strength.

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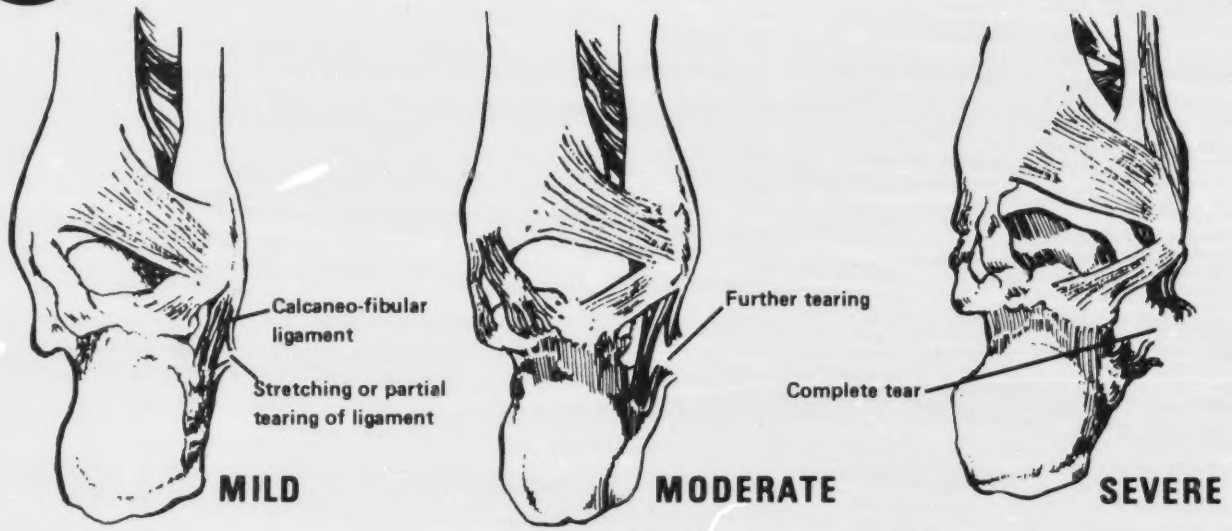
MECHANICS O

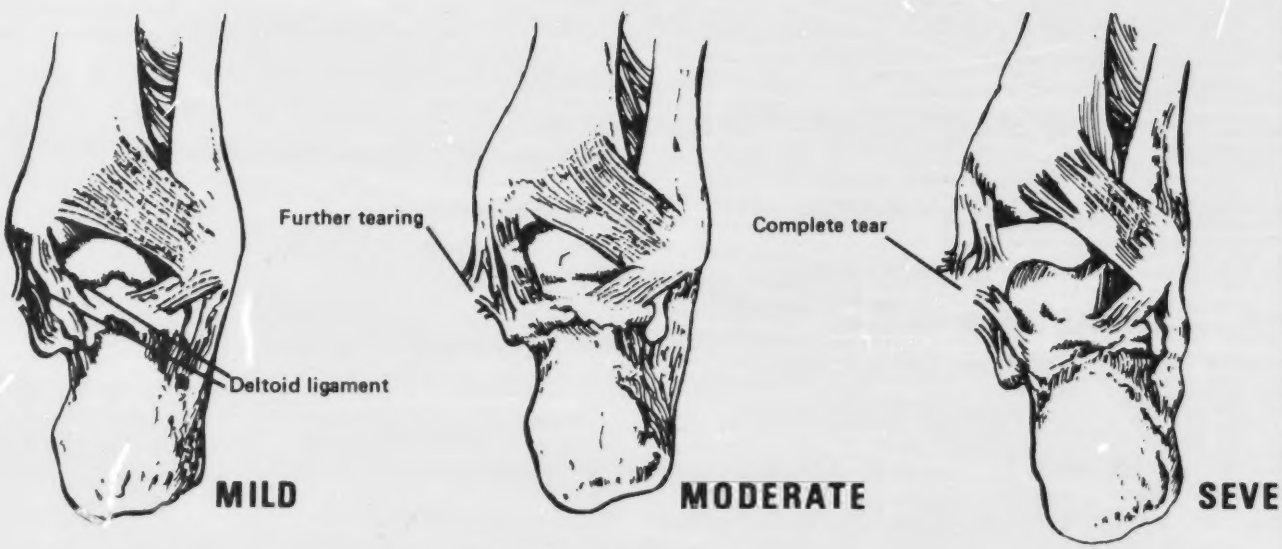


INVERSION

RIGHT FOOT

This is the most common type of ankle sprain. The more stress placed on the ankle the more severe the injury. This injury occurs when the athlete steps on the foot of an opponent, slides into a base or steps on uneven terrain.

REAR VIEW



RIGHT FOOT

EVERSION

REAR VIEW

This injury occurs when the foot is forcibly everted by an opponent falling against the outside of the leg or stepping on an uneven surface.

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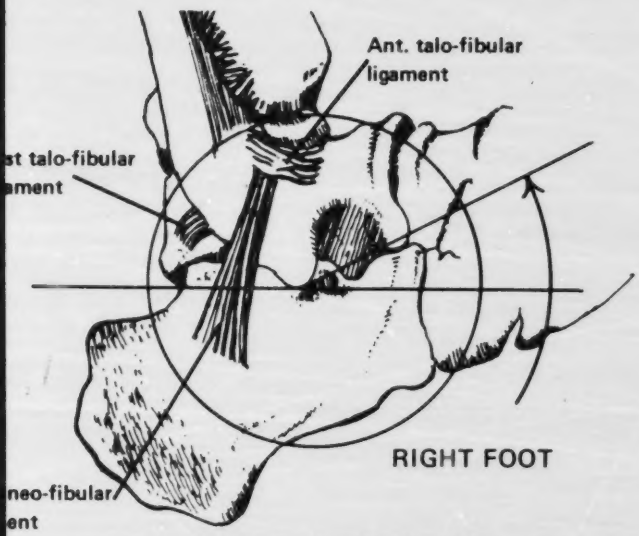
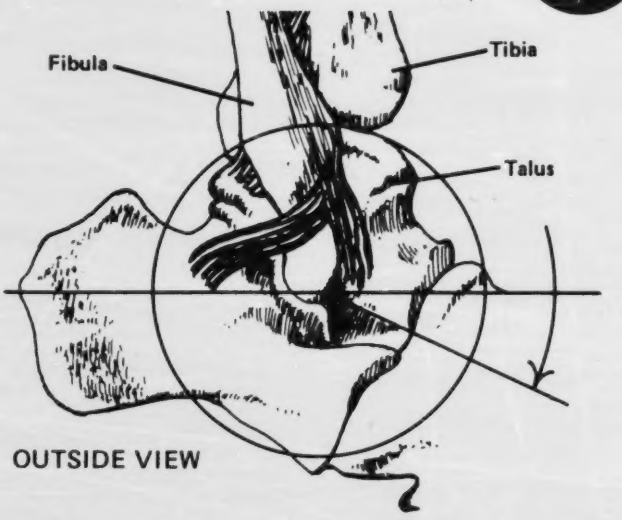
NKLE INJURIES



DORSIFLEXION

This injury occurs when the toes are forced upward. In addition to stress on the ligaments of the ankle the Achilles tendon is commonly involved.



PLANTAR FLEXION

When the toes are forced downward the structures of the front of the lower leg are often strained in addition to ligamentous structures of the ankle joint.

RIGHT FOOT
REAR VIEW

TIBIAL FRACTURE

FIBULAR FRACTURE

In some injuries the ligamentous structures stay intact and the force is placed on the skeletal attachments. When these attachments give the result is a fracture, should be splinted and referred to physician.

Sayers "Bud" Miller
University of Washington
Division of Sports Medicine

ANKLE EXERCISE PROGRAM

A. First Stage (Check range of motion.)

1. Flexion - flex foot as far as possible, point toes upward.
2. Extension - extend foot as far as possible, point toes downward.
3. Inversion - turn sole of foot inward.
4. Eversion - turn sole of foot outward.

B. If the above exercises can be done in full range of motion and without pain, do the following exercises:

1. Foot Circles - foot circumscribes a small circle. Ball of foot down first, then in, up and finally out.
2. Alphabet - sitting on table with knee straight and only ankle extended over the end of the table, print in capital letters the entire alphabet with your foot.

C. If the above exercises can be done in full range of motion and without pain, do the following exercises:

1. Towel Exercise - sitting on a chair with foot on a towel, pull towel up under foot with toes. After completing the above successfully, place a weight on the other end of the towel to offer resistance. (Pick the towel up with the toes, do not slide it along the floor.)
2. Pick-up Exercise - pick up marbles, small pieces of sponge rubber, or partly used roller bandage. Alternate placing the object in the hand opposite knee of good leg and in the hand behind buttocks of the injured leg.
3. Toe Rises - stand with feet one foot apart and toeing in. Rise on the toes as high as possible without pain. Also repeat this exercise with toes pointed straight ahead and pointed out.

D. If the above exercises can be done in full range of motion and without pain, do the following exercises:

1. Repeat range of motion exercises with the trainer giving resistance to the exercises with his hand.
2. Hopping Exercise - first standing on the good leg hop as high as possible. Then repeat on the injured leg.

E. When the athlete can perform the hopping exercise equally as well on his injured leg and without pain, do the following exercise:

1. Active jogging and walking with the ankle strapped.
   a. (1) Walk 25 yards; jog 25 yards
      (2) Walk 25 yards; jog 50 yards
      (3) Walk 25 yards; jog 75 yards

Note: Anytime the athlete limps, stop all running.

b. Straight ahead - repeat above walk and jog exercise except at 1/2 speed.
c. Straight ahead - repeat above walk and jog exercise except at 3/4 speed.
d. Straight ahead - repeat previous exercises except at full speed.

2. When the athlete can sprint at full speed and without a limp, then have her run circles both clockwise and counterclockwise. Start with large circles and work down to size.
3. When the athlete can run circles at full speed without a limp and without pain, then have her run figure eights.
4. When the athlete can run figure eights at full speed without a limp and without pain, then have her run a zig-zag course the length of the hockey field.
5. Finally the last step is to test the athlete on right angle quick cuts both to the right and left. When she can do this, she is ready for practice and competition.

All exercises should be repeated at least ten or more times daily.

When the athlete starts jogging with her ankle strapped, she can do all the previous exercises at home and on her own with the trainer checking twice a week on these exercises.

Sayers "Bud" Miller
University of Washington
Division of Sports Medicine

ARCH EXERCISE PROGRAM

Along with the following exercises it is essential that the patient wear correctly fitted shoes with a good hard supportive sole. Do not wear loafers, flats or thongs. Perform each of the following exercises the number of repetitions suggested as a starting point, and increase each exercise one repetition a day until you reach the maximum goal.

1. On back or sitting. Extend foot as far as possible, pointing toes downward. Then flex foot as far as possible, pointing toes upward.

   Starting point: 25 repetitions Goal: 50 repetitions Sets: 2-3/day

2. On back or sitting. Turn soles of feet inward so they face each other, then outward.

   Starting point: 25 repetitions Goal: 50 repetitions Sets: 2-3/day

3. On back or sitting. Foot circumscribes a small circle. Ball of foot down first, then in, and then up.

   Starting point: 25 circles Goal: 50 circles Sets: 2-3/day

4. On back or stomach. Start with soles of feet together, then breast-stroke kick.

   Starting point: 25 repetitions Goal: 50 repetitions Sets: 2-3/day

5. Sitting, injured leg across opposite knee. Using hand forcibly flex, extend, invert, evert and rotate the foot and ankle. Repeat each movement 3-4 times. This is a good warm-up exercise and should be performed between the other exercises.

6. Stand erect. Walk on outside of feet, toes curled in. Walk 25 yards in this manner.

   Starting point: 5 repetitions Goal: 25 repetitions

7. Stand with feet 12 inches apart and toeing in. Rise on toes as high as possible (with pain). Hold for a 3 second count and return to starting position.

   Starting point: 3 sets of 15 repetitions Goal: 3 sets of 25 reps

8. Alphabet exercise. Sitting, write out the entire alphabet in capital letters with your foot.

   Repeat 10 times a day.

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9. Rock up on toes and back again. Hold weights in hands to increase resistance.

   Starting point: 3 sets of 15 repetitions and 10 lb. dumbbells. Goal: 3 sets of 25 repetitions and 40-50 lb. dumbbells.

10. Stand on outer edge of feet and roll them back to normal again.

    Starting point: 3 sets of 25 repetitions. Goal: 3 sets of 50 reps.

11. Stand on outer edge of feet and then go up on toes. Hold for a 3 second count and then return.

    Starting point: 3 sets of 15 repetitions. Goal: 3 sets of 25 reps.

12. Run barefoot in sand, forward, backward, and zig-zag.

13. Calf-gripper. Bring foot up to knee and grip opposite calf with toes and arch.

    Starting point: 3 sets of 10 repetitions. Goal: 3 sets of 25 reps.

14. Stand, sit, etc. Heels together and toes out, move toes together and heels out. Return to starting position and repeat.

    Starting point: 3 sets of 25 repetitions. Goal: 3 sets of 50 reps.

15. Place golf ball under foot and roll it from toe to heel etc.

    Starting point: 25 repetitions. Goal: 50 repetitions.

16. Pick up marble with toes. (a) Place in hand opposite knee of good leg. (b) Place in hand behind buttocks of injured leg.

    Starting point: 3 sets of 10 repetitions for each exercise. Goal: 3 sets of 25 repetitions for each exercise.

17. Sitting position. Feet on towel. Pull towel up under foot with toes. May place a weight or heavy book on end of towel to offer resistance. Perform 3 sets of 15 repetitions.

18. Sitting position. Hold one leg straight and slowly bring opposite toe up shin as far as possible. Perform 3 sets of 15 repetitions.

19. Roll sole of foot over baseball bat. Perform 3 sets of 25 rolls each.

20. Run or walk up steps on toes. Starting point: 5 flights of stairs (25 steps to a flight). Goal: 20 flights of stairs (25 steps to a flight).

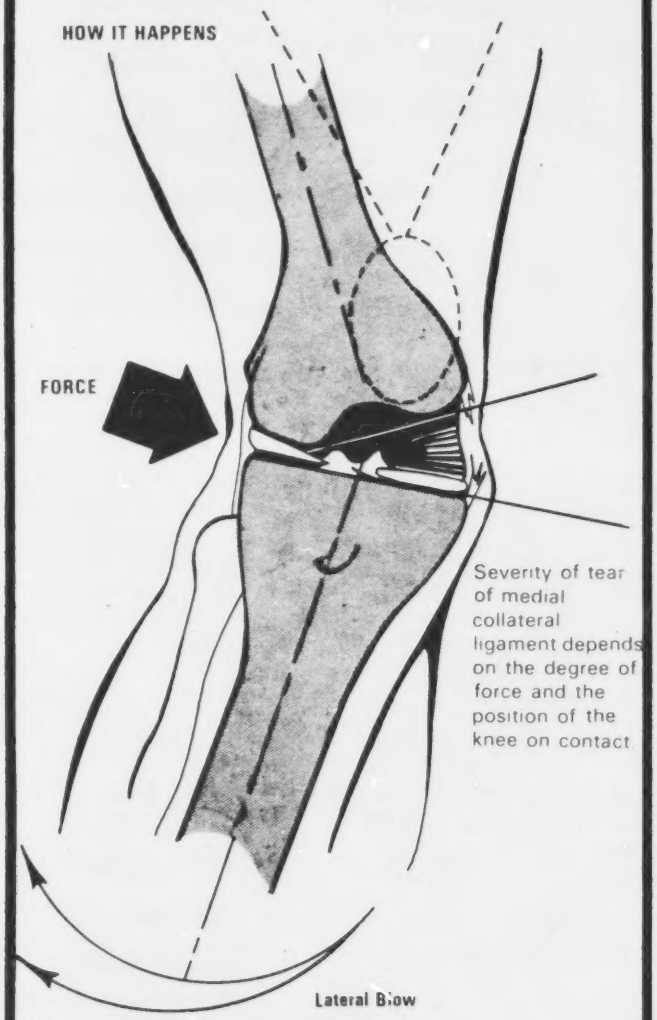
21. Toe-curling exercise. Stand on edge of a stair and try to grasp the edge with the toes. May also try to grasp a chair rung.

    Starting point: 3 sets of 15 repetitions. Goal: 3 sets of 25 reps.

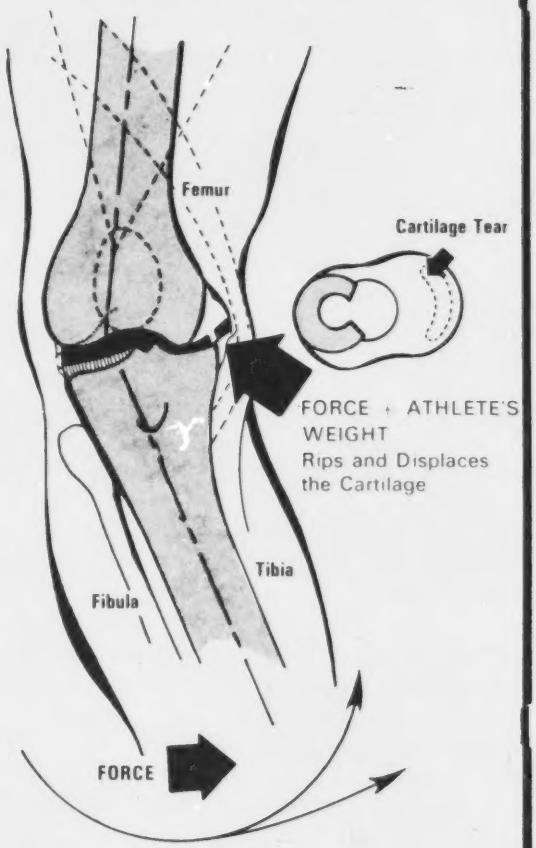
22. Swimming or whirlpool. If possible, perform as many of the above exercises in the swimming pool or in a whirlpool.

the knee injury

MECHANICS OF MEDIAL COLLATERAL LIGAMENT INJURY (FOOTBALL KNEE)


HOW IT HAPPENS
FORCE
Severity of tear of medial collateral ligament depends on the degree of force and the position of the knee on contact
Lateral Blow

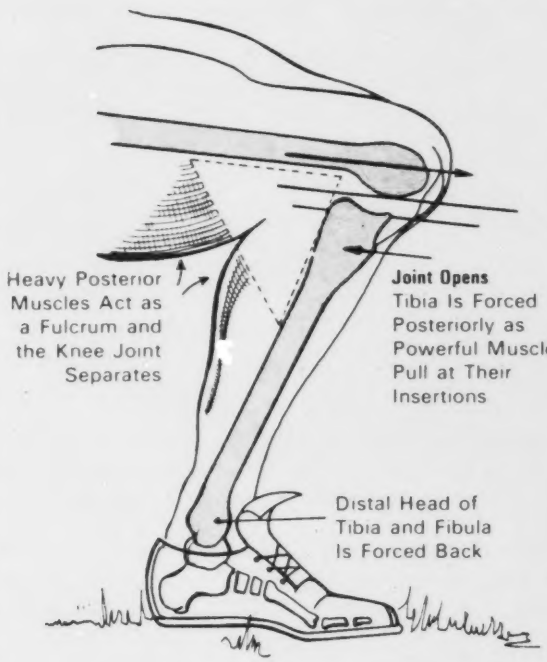
MECHANICS OF KNEE CARTILAGE TEAR IN THE "BUCKET HANDLE"



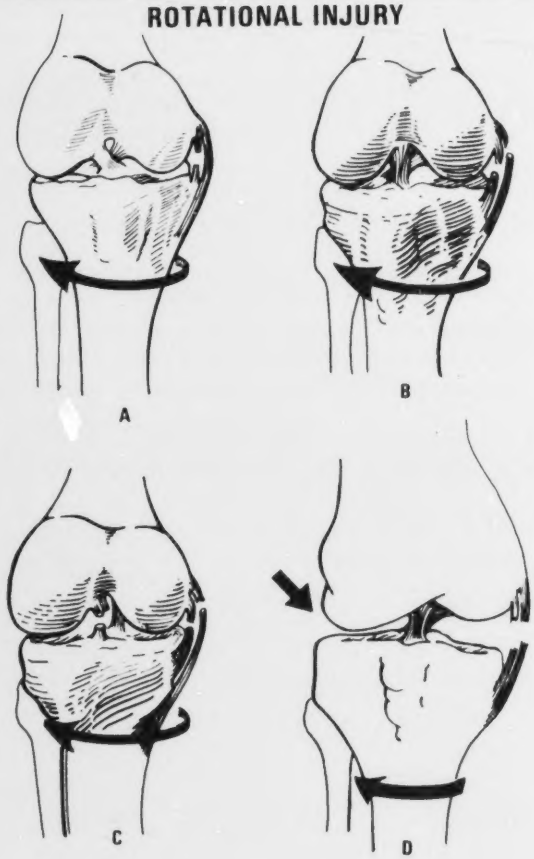
HOW IT HAPPENS

(A) The foot and lower leg are forced into sudden abduction
(B) Tibia rotates medially
(C) Medial condyle of femur gouges into cartilage
(D) Cartilage rips from bony anchorage
(E) Typical cartilage tear occurs

THE BASIC MECHANICS IN ANTERIOR CRUCIATE RUPTURE
In Knee-Bend Calisthenics


Heavy Posterior Muscles Act as a Fulcrum and the Knee Joint Separates
Joint Opens
Tibia Is Forced Posteriorly as Powerful Muscles Pull at Their Insertions
Distal Head of Tibia and Fibula Is Forced Back

ROTATIONAL INJURY



A, On forced external rotation of the tibia on the femur, rupture of the midportion of the medial capsular ligament occurs first and is present in every instance. **B**, Rupture of the overlying tibial collateral ligament. **C**, Still further external rotation will cause a tear of anterior cruciate ligament. **D**, Forced valgus and external rotation will precipitate ligamentous rupture sooner than will external rotation alone.

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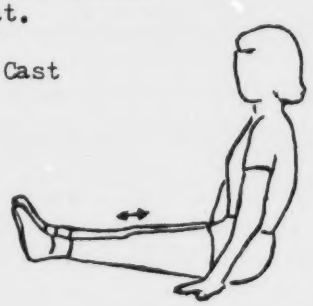
Holly Wilson
University of Iowa

REHABILITATION EXERCISES FOR THE KNEE
(Following Traumatic Injury or Surgery)

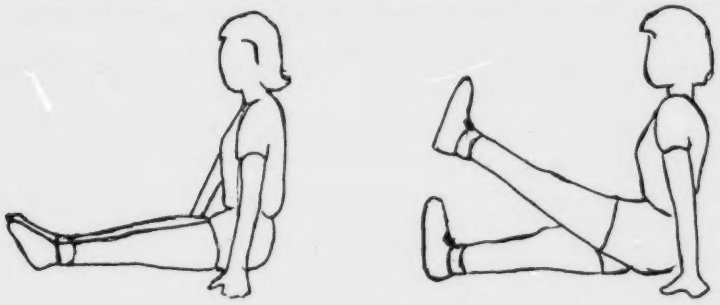
The exercises in this program are arranged in progressive order to be initiated immediately after surgery or traumatic injury. Prior to exercising, the athlete should massage both the hamstring and quadricep muscle groups and the knee joint with ice for at least eight minutes. The ice will act as an anaesthetic and enable the athlete to move her knee through a greater range of motion without discomfort. After approximately three minutes of exercise, the athlete should once again massage the area with ice. Apply ice in sets of three - 8-3, 8-3, 8-3, three times a day. The exercise program should start with stretching of the hamstring and quadricep muscle groups.

I. Stretching Exercises
   A. Quadriceps - requires the assistance of another person.
      1. Lie supine on a table.
      2. Flex one knee and lift the lower leg so it is parallel to the table. (The athlete may require the assistance of another person to lift the leg to this position.)
      3. The assistant places one hand on the sole of the foot and the other hand on the athlete's kneecap.
      4. The assistant gently pushes the knee toward the athlete's head, keeping the leg flexed and parallel with the table.
      5. Slight discomfort should be felt by the athlete in the quadriceps area.
      6. Return to starting position.
      7. Repeat with other leg.
   B. Hamstrings - "V" Sit
      1. Sit on the floor with the legs spread apart to form a "V".
      2. Slowly bend forward to the point of discomfort.
      3. Relax.
      4. Attempt to bend farther forward. DO NOT BOUNCE.
      5. Return to starting position and repeat.

II. Exercises to be Executed while Confined to a Cast
   A. Quad Setting
      1. In a sitting position, attempt to pull the kneecap upward by tightening the quadricep muscles.
      2. Hold for a count of three.
      3. Relax.
      4. Repeat the exercise for 5 minutes of each waking hour of the day.
      5. Precautions: The knee should be kept as straight as possible during the execution of the exercise.



B. Leg Raising
1. In a sitting position, lock the knee.
2. Lift the leg upward to a count of three.
3. Hold for a count of one.
4. Lower leg to starting position to a count of three.
5. Repeat the exercise for 2 minutes of every waking hour.



Note: To add more resistance cross the uninjured leg over the cast and lift.

This exercise may be done in the prone position to strengthen the hip extensors and hamstrings.

C. Sit-ups
1. In a supine position with the arms at the side of the body, flex the good leg.
2. Slowly curl the head and trunk off the floor, one vertebrae at a time.
3. When the trunk is perpendicular to the floor, straighten the good leg and stretch forward trying to touch the chest to the knees. DO NOT BOUNCE.
4. Slowly uncurl the body one vertebrae at a time and return to the starting position.
5. Flex the good leg and repeat.

Continue these exercises after the cast has been removed.

III. Range of Motion Exercises
A. Limited Flexion
1. Sit on a table with the injured leg extended over the edge.
2. Place a pad under the knee to level off the thigh.
3. Apply a weight (disc weight or sandbag) to the ankle.
4. Weight of the leg plus external weight will assist the force of gravity in flexing the leg.

B. Limited Flexion
1. Sit on a table with the injured leg flexed.
2. Grasp shin of the injured leg and slowly and gently pull heel toward the buttocks.

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C. Limited Flexion
   1. Kneel on a cushion.
   2. Gently lean back on haunches attempting to touch buttocks to heels. DO NOT BOUNCE.

D. Limited Flexion
   1. Assume a 4 point position on hands and knees with feet against a wall.
   2. Gently lean backward.

E. Limited Flexion
   1. Stand in the corner of a swimming pool or a whirlpool.
   2. Hold onto the edges and slowly bend the knees. DO NOT BOUNCE.
   3. Straighten the legs and repeat.
   4. Precautions: Do not go beyond a half squat.

F. Limited Extension
   1. Lie in a prone position on a table.
   2. Apply a weight to the ankle for 10-20 minutes.

G. Limited Extension
   1. Standing, place the heel of the injured leg on a low chair.
   2. Place hands on the kneecap.
   3. Slowly and gently apply pressure to the kneecap to straighten the leg.

H. Limited Extension - requires chair or stool with coasters.
   1. Sit on a chair.
   2. Position the foot of the injured leg on a chair or stool with coasters facing athlete.
   3. Apply a weight to leg, just above and below the knee joint.
   4. Relax.
   5. Maintain position for 10-20 minutes.

IV. Strengthening Exercises

General Instructions: Choose at least six exercises, one from each of the six groups (extension, flexion, half squats, abduction and adduction, gastrocnemius and rotators) Start with the easiest exercise of each group which is executed with no resistance other than gravity. With an increase in proficiency in executing the exercise, increase the overload. Either add more repetitions or more weight.

In those exercises that do not require an external overload (disc weight) start with 1 set of 10 repetitions. When 10 repetitions of the exercise can be executed correctly with ease and no discomfort, do 2 sets of 10. When 3 sets of 10 can be executed, meeting the above criteria, increase resistance by adding anatomical resistance or external weight.

The starting weight is the maximum amount of weight the athlete can lift 10 times in succession with no discomfort. The exercises should not elicit pain. The weight is individually determined and will change with each exercise. Following knee surgery, the athlete should start with light weight, positioned close to the knee joint, to avoid placing too much stress on reconstructed structures.

When external weight is added, the progression is based on the DeLorme Theory. Weight is progressively added to maintain an overload as muscle strength is gained, but not enough to cause injury.

A. 1 set of 10 repetitions at 1/2 R.M. (The maximal amount of weight the athlete can lift 10 times in succession with no discomfort.)
1 set of 10 repetitions at 3/4 R.M.
1 set of 10 repetitions at R.M.

B. 1 set of 10 repetitions at 1/2 R.M.
1 set of 10 repetitions at 3/4 R.M.
2 sets of 10 repetitions at R.M.

C. 1 set of 10 repetitions at 1/2 R.M.
1 set of 10 repetitions at 3/4 R.M.
3 sets of 10 repetitions at R.M.

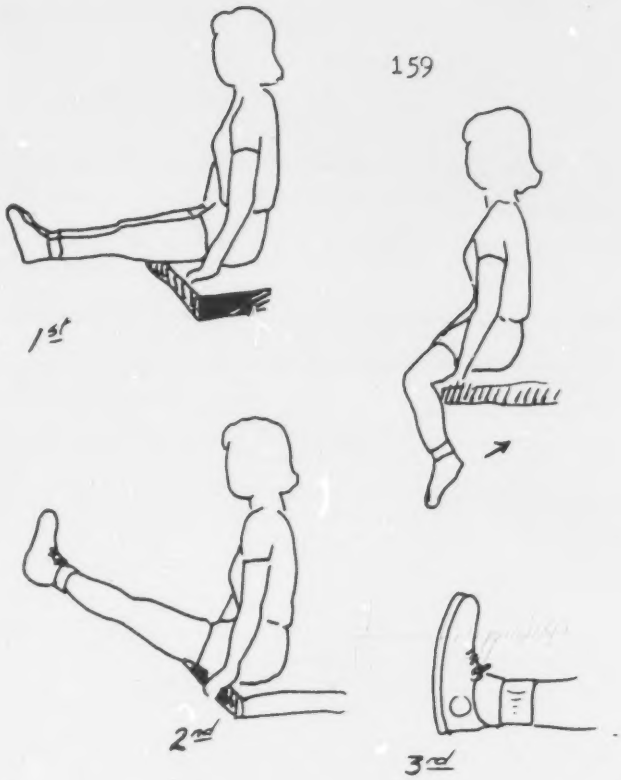
Retest athlete to determine new R.M.

D. 1 set of 10 repetitions at 1/2 new R.M.
1 set of 10 repetitions at 3/4 new R.M.
1 set of 10 repetitions at new R.M.

Start with series A. When the thirty executions of an exercise can be done correctly with ease and no discomfort, move on to series B. After completing series C, it is necessary to retest the athlete for a new maximal weight (R.M.)

Whenever weight is added, always decrease the number of repetitions.

A. Extension Exercises - arranged in progression
1. Against Gravity
a. Sit on edge of table with legs hanging over the side.
b. Place a pad under knee to level off thigh. (Provides for better leverage.)
c. Extend the leg to a count of three.
d. Hold for a count of one.
e. Lower leg to starting position to a count of three.
f. Start with 1 set of 10.
g. Goal: 3 sets of 10.



1st execution: Lift to level of table and hold. This range of movement requires no hip flexion. Return to starting position and flex leg under table as far as possible. Strengthens lower quadriceps.

2nd execution: Lift leg above the table's edge. Requires use of the hip flexors. Return to starting position and flex leg under table as far as possible. Strengthens the upper and lower quadriceps.

3rd execution: Follow the instructions for step 2 but dorsal flex the foot.

2. With Resistance
   a. Add resistance by crossing the uninjured leg over the injured one and lift.
   b. Start with 1 set of 10 repetitions. If the overload is too great, drop down to 1 set of 5 repetitions.
   c. Goal: 3 sets of 10.
3. With External Weight
   a. Attach an iron boot or sandbag to the foot of the injured leg and lift.
   b. Use the progression explained on the preceding page.
   c. Goal: 10-15 pounds, 3 sets of 10 with preliminary warm up of 10 repetitions each of 1/2 and 3/4 R.M.
   d. Precautions: Support the iron boot on a bench and provide support under the knee (pad) to eliminate stress on the joint.

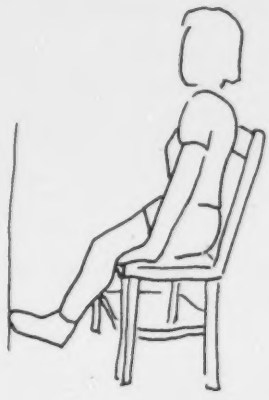
When the athlete can lift 10-15 pounds, 3 sets of 10 with the preliminary warm up, use another method of providing overload.

Note: Attach a velcro strip or belt to a sandbag so it may be fastened to an ankle or thigh.

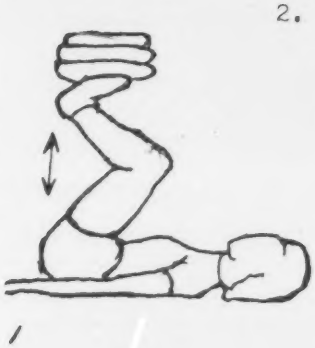
4. Knee Machine - Goal: 1/3 of body weight, 3 sets of 10 with preliminary warm up of 10 repetitions each of 1/2 and 3/4 R.M.

B. Alternate Exercises for the Development of the Quadriceps

1. Isometric Against Wall
   a. Sit on a bench close to wall with toes of injured leg in contact with wall.
   b. Have enough room between bench and wall to flex knee at various angles and have toes remain in contact with wall.
   c. Flex knee at 105° and push against wall with toes for a count of seven.
   d. Flex knee at 150° and push against wall with toes for a count of seven.
   e. Do 10 repetitions for each angle.



2. Press Bar
   a. Lie supine under press bar.
   b. Raise weights by extending the legs to a count of three.
   c. Hold for a count of one.
   d. Lower weights by slowly flexing the knees to a count of three.
   e. Repeat.
   f. Start with 1 set of 10 repetitions with preliminary warm up of 10 repetitions each of 1/2 and 3/4 R.M.
   f. Goal: 3 sets of 10 repetitions with preliminary warm up, 1/3 of body weight.



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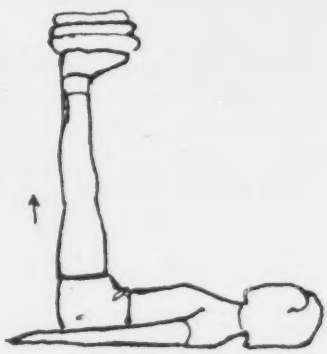

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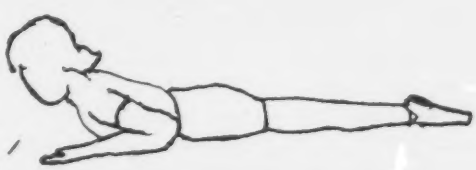
C. Flexion Exercises - Exercise in various positions, at different degrees of flexion, to strengthen the entire muscle group.

1. Flexion Against No Resistance
   a. Lie on abdomen on floor.
   b. Flex knee of injured leg.
   c. Pull heel toward buttocks to a count of three.
   d. Hold for a count of one.
   e. Return to starting position to a count of three.
   f. Start with 1 set of 10 reps.
   g. Goal: 3 sets of 10.
   h. To convert to an isometric have assistant apply resistance. Resistance should be less than that which causes discomfort.



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i. Precautions: Muscle Spasms.

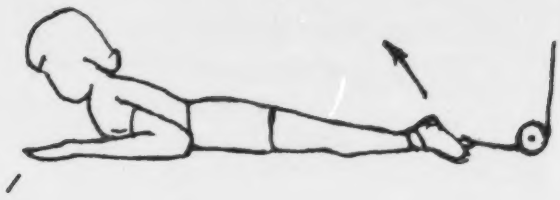
2. Flexion with Weight - Knee Curl - requires the use of an iron boot.
   a. Stand facing wall with hands resting on wall at chest height.
   b. Foot without iron boot is elevated on a 4 inch block.
   c. Flex the injured leg to a count of three until the heel approaches or touches the buttocks.
   d. Hold for a count of one.
   e. Straighten leg to a count of three.
   f. Start with 1 set of 10 repetitions with preliminary warm up of 10 repetitions each of 1/2 and 3/4 R.M.
   g. Goal: 3 sets of 10 repetitions with preliminary warm up. Ultimate goal is 2/3 of the weight that can be lifted by the quadriceps.
   h. Precautions: Keep head forward and back straight.

      Foot with iron boot should be at right angle with leg.

      2/3 of the weight that can be lifted by the quadriceps is too heavy to control. Limit weight to 10 pounds.

3. Knee Machine - Goal: 2/3 of the weight that can be lifted by the quadriceps, 3 sets of 10 with the preliminary warm up.

D. Alternate Exercises for Developing the Hamstrings
   1. Leg Flexion with Pulley Apparatus
      a. Lie prone on the floor.
      b. Attach pulley apparatus to ankle of injured leg.
      c. Flex knee at various angles for a starting point.
      d. Pull heel toward buttocks to a count of three.
      e. Hold for a count of one.
      f. Return to starting position to a count of three.
      g. Start with 1 set of 10 repetitions with preliminary warm up.
      h. Goal: 3 sets of 10 repetitions with preliminary warm up. 2/3 of the weight that can be lifted by the quadriceps.



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E. Half Squats - requires use of barbell.
1. Squat on bench with barbell resting on shoulders.
2. Slowly rise to a standing position to a count of three.
3. Hold for a count of one.
4. Return to starting position slowly to a count of three.
5. Start with 1 set of 10 repetitions.
6. Goal: 3 sets of 10 repetitions.

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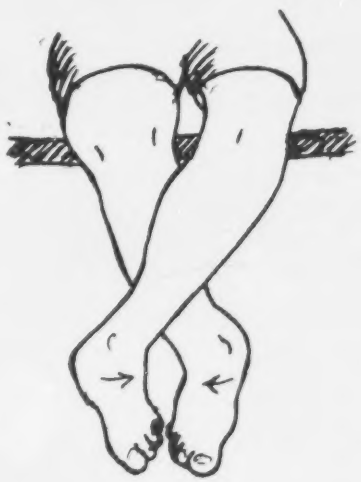
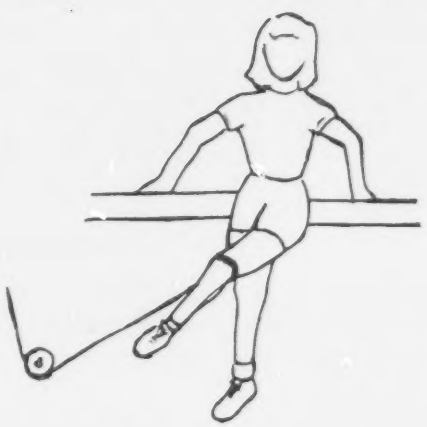
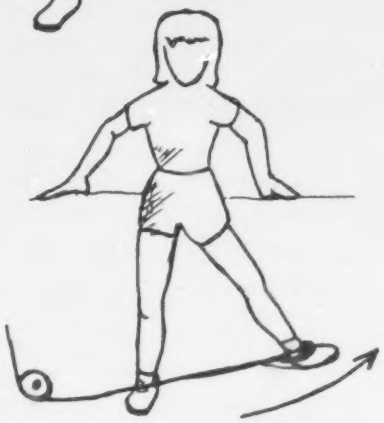


F. Abduction and Adduction Exercises
1. Resistance Abduction
   a. Sit on a table with legs hanging over edge.
   b. Cross ankles.
   c. Pull one leg sideways against the resistance of the other to a count of seven.
   d. Do 1 set of 10 repetitions.
2. Abduction with Pulley Apparatus
   a. Stand with side of body to pulley apparatus.
   b. Attach cuff of pulley to thigh of injured leg just above kneecap.
   c. Support the body weight on the uninjured leg.



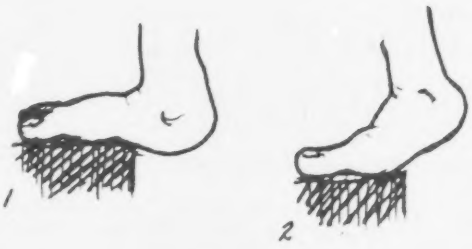
d. Cross the injured leg over the other.
e. Abduct the injured leg to a count of three.
f. Hold for a count of one.
g. Return to starting position to a count of three.
h. Start with 1 set of 10 repetitions.
i. Goal: 3 sets of 10 repetitions.
j. Precautions: If the cuff is placed at the ankle, the overload is too great for a recently injured knee.

Move the cuff down the leg as the muscles become stronger.



3. Abduction Lying on Side
   a. Lie on side.
   b. Brace body with one palm on the floor in front of the chest and the underneath arm extended overhead.
   c. Abduct the leg.
   d. Start with 1 set of 10 repetitions.
   e. Goal: 3 sets of 10 repetitions.
   f. Precautions: Keep back straight.
   g. As the muscles become stronger, provide resistance in the form of an iron boot or sandbag.

G. Gastrocnemius
   1. Toe Rises without Weight
      a. Stand on the edge of a stair.
      b. Raise up on toes and hold for a count of one.
      c. Lower body weight so the heels are below the edge of the stair.
      d. Hold for a count of one.
      e. Return to starting position (feet parallel with edge of stair).
      f. Start with 1 set of 10 repetitions.
      g. Goal: 3 sets of 10 repetitions.



2. Toe Rises with Weight
   a. Follow the instructions on the preceding page except stand on a block and hold a barbell on the shoulders.
   b. Start with 1 set of 10 repetitions.
   c. Goal: 3 sets of 10 repetitions.

H. Knee Rotators - Internal and External Rotation
   1. Range of Motion
      a. Sit with the injured knee in a flexed position.
      b. Turn the toes inward.
      c. Turn the toes outward.
      d. Initiate the movement from the knee. Stabilize the hip.
      e. Start with 1 set of 10 repetitions.
      f. Goal: 3 sets of 10.
   2. Rotation Against Resistance - requires help of assistant.
      a. Follow the instructions for the preceding exercise.
      b. Assistant will provide manual resistance.
      c. Start with 1 set of 10 repetitions.
      d. Goal: 3 sets of 10.
   3. Rotation with External Weight - use a sandbag or disc weight.
      a. Start with 1 set of 10 repetitions.
      b. Goal: 3 sets of 10.
   4. Figure 8's of Decreasing Size

V. Supplementary Exercises
   A. Walk - forward and backward.
   B. Jog at a speed that the athlete feels no pain.
   C. Run at a speed that the athlete feels no pain.
      1. Slowly increase speed.
      2. Run both forward and backward.
   D. Swim
      1. Use the flutter kick only.
      2. Avoid the whip and frog kicks.
   E. Run Bleachers
      1. Run up and walk down.
      2. Do not toe out.

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F. Bicycle
   1. Use a bicycle ergometer or a regular bicycle (preferably without gears).
   2. Make sure the athlete is getting full extension of the leg.

Note: Any of the above supplementary exercises (except D) may be made more difficult by adding external weight to the athlete's shoulders or around her waist.

In strengthening exercises for the quadriceps, full extension is necessary to strengthen the vastus medialis.

Ideally, normal quadriceps strength should equal 100% of the body weight and normal hamstrings strength 60% of the body weight.

Sandbags may be substituted for the iron boot required in many of the exercises. They are inexpensive and easy to make.

Return to activity is determined by the physician based on the following criteria:

1. The girth of the quadriceps and the gastrocnemius of both legs should be equal.
2. The athlete should be able to run figure 8's of decreasing size without a limp.
3. The range of motion should be normal.
4. The athlete should be able to lift 1/3 of her body weight 10 times in 60 seconds.
5. The athlete should be able to squat against a wall for 60 seconds with her knees and hips flexed at 90°.
6. The athletes should be able to balance her full weight on the toes of the affected leg.

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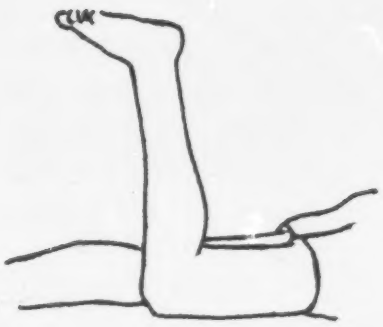
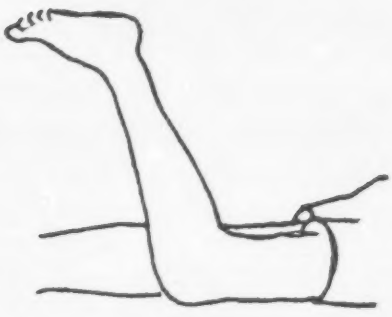
QUADRICEPS CONTUSION
FUNCTIONAL TESTS*



90° flexion of the knee usually indicates there is only a mild contusion.



When flexion is limited to less than 90°, the injury is more serious. Blood has escaped from torn capillaries into the muscle tissue. Swelling and pain limit the range of motion.

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Sayers "Bud" Miller
University of Washington
Division of Sports Medicine

STRETCHING EXERCISES FOR LOWER EXTREMITIES

1. Quadriceps
   a. In a kneeling position, lean the upper part of the trunk backward toward the ground. Try to touch the shoulder blades to the ground.
   b. Lying on the stomach, pull the heels to the buttocks.

2. Hamstrings
   a. Manual Stretching
      (1) Starting position - Lie on your back with your legs extended. Keep knees locked and relax the leg being stretched.
      (2) Partner's position - Kneel down facing your partner. Grab your partner's ankle and gradually move the leg through a 90° arc. Do not jerk the leg up or force the leg, this could cause a tear in the muscle belly. Always keep the knee locked. Make sure the opposite leg maintains its extended position on the ground or table and the knee is locked. Hold this position for a count of 25. Apply firm pressure at all times.
   b. Cross over the legs and touch the toes while the knees are locked. Hold this position for a count of 20. Do not bounce or jerk.

3. Low Back
   a. Lie flat on your back. Bend one knee toward the chest and pull it down to the chest with both hands. Keep your head on the ground and pull the knee very slowly toward the chest. Hold for 10 counts. Repeat this same procedure for the other leg. Do the exercise 20 times for each leg.
   b. Partial Sit-ups (knees bent)
      (1) Start out by lying flat on your back with your knees bent, keeping the balls of the feet flat on the ground.
      (2) Lift up your head, shoulders, chest, abdomen - one vertebrae at a time (curl or roll up).
      (3) Move your body forward between the knees.
      (4) Slowly return to starting position - one vertebrae at a time (uncurl).
   *c. Lying flat on your back with your legs extended and arms straight out from the shoulders, lift one leg and cross it over the body to touch the palm of the opposite outstretched arm. Reverse this position for the other leg.
   *d. Standing erect with the feet 12-15 inches apart, twist and bend at the hips and touch the opposite foot with both hands. Touch the back of the heel. Keep both knees locked.

* Especially for throwing events and hurdlers

4. Gastrocnemius, Soleus and Achilles Tendon
   a. Start out in a standing position with the feet 4-5 inches apart. Face a wall with the palms of the hands resting upon it.
   b. Bend the elbows, keeping the heels flat on the ground. Keep the hips in front of the body and do not arch the back.

5. Groin
   a. In a sitting position, place the soles of the feet together, heels close to the buttocks.
   b. Grasp the toes with your hands and pull your forehead toward your toes.

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Mel Blickenstaff
Indiana State University

RECOMMENDATIONS TO IMPROVE A WEAK BACK

In the exception of specific injuries most back ailments can be attributed to poor posture. The following suggestions are designed to help correct these postural defects and to strengthen back muscles.

Sleeping Habits

1. Sleep on a firm mattress.
2. In case the mattress does not give uniform support, place a sheet of 3/8 inch plywood between the springs and mattress.
3. Sleep on your side with one or both legs pulled up to your chest.
4. Never sleep on your stomach.

Standing and Sitting

1. Concentrate on correct posture at all times.
2. Keep the trunk, neck, and head in a straight line.
3. Pull your stomach in.
4. Keep your shoulders back.

Driving Habits in Car

1. Adjust front seat so as to bring knees in closer to the chest.
2. Sit tall.

Exercises

YOU MUST EXERCISE AT LEAST 15 MINUTES PER DAY TO GET THE DESIRED RESULTS!!

1. Exercises in Group I are designed to help strengthen the lower back muscles and to straighten improper curvature. Beginning repetitions should start at five each. Begin heavier exercises after approximately one week.

2. Group II stresses correct posture. Approximately five minutes per day should be spent standing correctly.

Light Exercises for Back

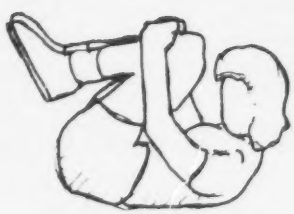
Group I

Exercise No. 1
Lie flat on back with pillow under your knees. Flatten back against floor by:
(1) Pulling stomach in and up.
(2) Tightening muscles of buttocks.

Exercise No. 2
Lie flat on back, place hands behind head, bend knees, place feet flat on the floor. Flatten back against floor.
(1) Straighten legs by sliding heels along the floor.
(2) Keep back flat and straight.

Exercise No. 3
Lie flat on back with arms folded on chest. Flatten back against floor.
(1) Raise head and shoulders approximately six inches off the floor (one vertebrae at a time - curl-up).
(2) Tighten stomach muscles.

Exercise No. 4
Lie flat on back with knees on chest, legs on the thighs, arms at sides with palms down.
(1) Raise buttocks off floor.
(2) Pull knees toward chin.



Exercise No. 5
Lie flat on back with knees on chest, legs on the thighs, arms wrapped around legs, hands on knees. Pull knees against chest.

Heavier Exercises for Back

Group I

Exercise No. 1

Start from a standing position.

(1) Raise right knee to chest and pull it against the chest (slowly and steadily).
(2) Hold for a count of three and then return to starting position.
(3) Raise left knee to chest and pull it against the chest (slowly and steadily).
(4) Hold for a count of three and then return to starting position.
(5) Keep the back straight throughout the execution of the exercise.

Exercise No. 2

Lie flat on back, legs extended with feet together and arms at sides.

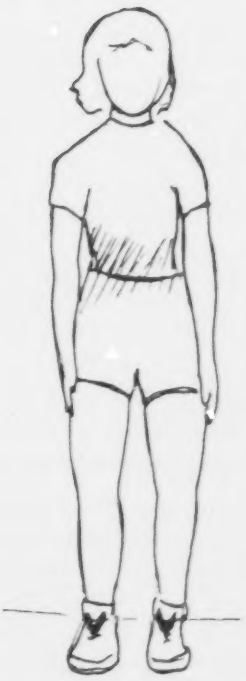
(1) Slide left knee slowly upward keeping the knee against the floor and the foot against the opposite leg.
(2) Raise left knee to a perpendicular position and bring it as close as possible to the chest.
(3) Keep left knee as close to the chest as possible and rotate left leg (bent) slowly across body to floor on right (3/4 turn). The kneecap should point straight ahead. Keep the shoulders in contact with the floor. 3a*

(4) Slide left leg slowly downward keeping the foot against the opposite leg. Continue downward until leg is extended.
(5) Repeat exercise with right leg.

(3a) When step 3a can be executed with ease and no discomfort, rotate the leg (bent) across the body a full turn. The kneecap should point toward the floor. Keep the shoulders in contact with the floor.

Standing Posture

Group II



Exercise No. 1

Stand with back to wall, hands clasped behind head, elbows touching wall. The feet should be approximately four inches from the wall and pointed straight ahead.

(1) Pull chin in.
(2) Pull shoulders back against wall.
(3) Flatten lower back against wall by:
    (a) Pulling stomach muscles in and up.
    (b) Pulling buttocks down to shift the position of the pelvis.
(4) Hold position for 30 seconds and then step away from the wall

REPEAT for a total of five minutes!!

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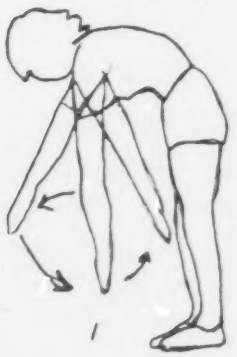
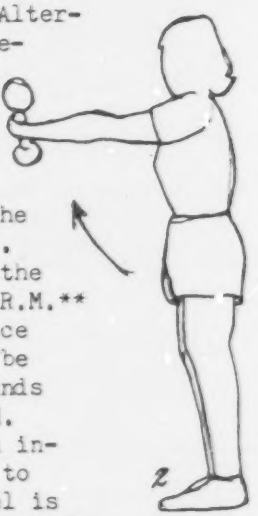
Bob Shelton

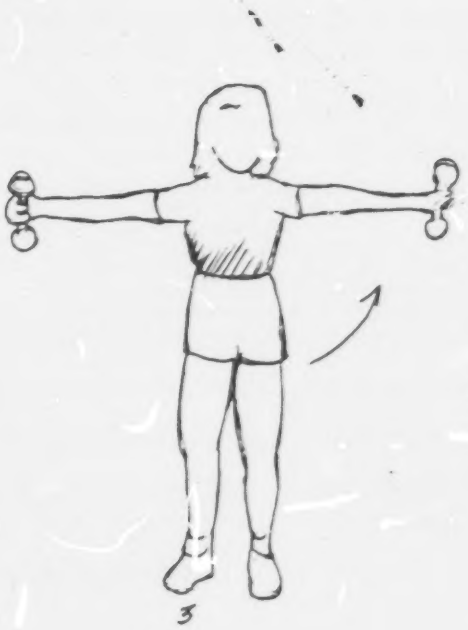
THERAPEUTIC EXERCISES FOR SHOULDER JOINT DISABILITIES



1. Active Circumduction*
   In a standing position bend forward at the waist. Relax the shoulder and rhythmically move the arm in a clockwise and counterclockwise direction 10 repetitions each. Alternate for three bouts of 10 repetitions.



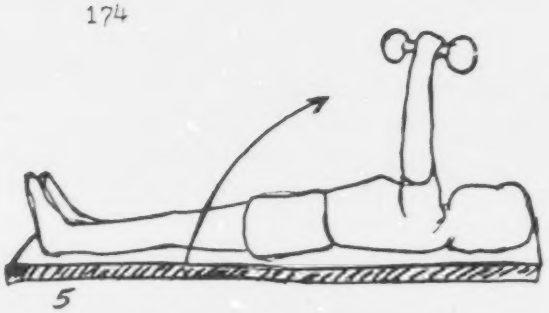
2. Flexion
   In a standing position raise the arms forward to shoulder level. Begin with the maximum weight the athlete can lift rhythmically R.M.** From 0 to 5 pounds of resistance the three R.M. routine should be used. When tolerance of 5 pounds or more is reached the one R.M. routine should be used with an increase of repetitions from 10 to 20 as each new resistance level is reached. This progressive procedure is used in all the remaining exercises.



3. Abduction
   In a standing position raise the arms sideward to shoulder level.

*This exercise is for the acute case and should be done without resistance. The shoulder wheel can be substituted for this exercise when resistance is indicated.

**R.M. - maximum weight which can be lifted consecutively for 10 repetitions.



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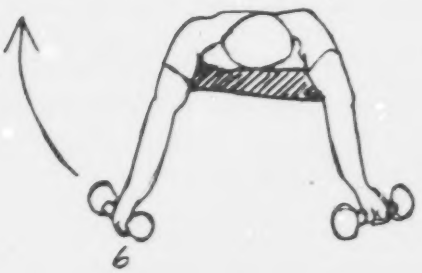
4. Hyperextension
In a standing position raise arms backward. The athlete should be bent forward at the waist, or in a prone position on a table. Begin with arms hanging down in flexion.



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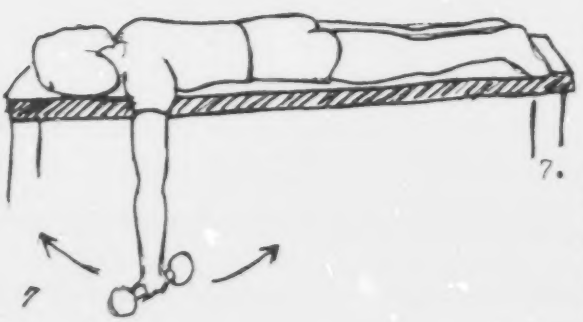
5. Horizontal Flexion
In a supine position raise the arms upward to a position of flexion. Keep the arms in a position of 90 degrees to the body. Lower the arms to a position of abduction.

6. Horizontal Abduction
In a prone position raise the arms to full abduction (with scapula adducted). Lower arms to a position of flexion. Keep arms in a position of 90 degrees to the body.



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7. Rotation***
In a prone position keep the elbows fixed at 90 degrees to the body, with lower arm over edge of table with weight in hand. Move lower arm in direction of arrows.

Note: Until full range of motion is obtained, assistive stretching can be used at the terminal end of movement in each exercise.

***This exercise should not become a part of the routine until maximum strength and range of motion is attained in all others.

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SHOULDER REHABILITATION PROGRAM

BEGINNING EXERCISES

1. Range of Motion Exercises

   a. Forward Flexor - Keeping the elbow straight and stiff, raise the arm forward and then return to starting position. (3 sets of 15 reps, minimum of 3 times daily.)

   b. Lateral (sideward) Raises - Keeping the elbow straight and stiff, raise the arm sideways (laterally) from the body and then return to the starting position. (3 sets of 15 reps, minimum of 3 times daily.)

   c. Posterior (backward) Raises - Keeping the elbow straight and stiff, raise the arm backward and then return to starting position. (3 sets of 15 reps, minimum of 3 times daily.)

   d. Rotation - Keeping the elbow tight to the side of the body and flexed at a 90° angle, move the forearm out away from body and then back towards the stomach. (3 sets of 15 reps, minimum of 3 times daily.)

2. Ape Drill (Note: Perform these exercises before a mirror so that you can make sure you don't lean the body forward or sideways. You must keep the body erect.)

   a. Clockwise Circles - Keeping the trunk bent forward at a 90° angle, allow the shoulder to relax and slowly swing the arm in a clockwise, circular pendulum motion. (3 sets of 15 reps, minimum of 3 times daily.)

   b. Counterclockwise Circles - Same position as in clockwise circles, except for swinging arm in a counterclockwise, circular pendulum motion. (3 sets of 15 reps, minimum of 3 times daily.)

   c. Backward and Forward Swings - Same positioning as in clockwise circles, except for swinging arm forward and backward along the side of the body in a pendulum motion. (3 sets of 15 reps, minimum of 3 times daily.)

   d. Sideward Swings - Same positioning as in clockwise circles, except for swinging arm out sideways from the body and back towards the body in a pendulum motion in front of the body. (3 sets of 15 reps, minimum of 3 times daily.)

3. Wall Climb

   a. Sideward Wall Climb - Injured side to the wall. Arm bent, walk arm up wall as high as the shoulder will permit by alternately moving the forefinger and middle finger. Lower arm in the same manner. (3 sets of 10 reps, minimum of 3 times daily.)

   b. Forward Wall Climb - Same as sideward wall climb except the athlete faces the wall.

4. Isometric Exercises

   a. Bend Knees so arms are parellel to back of a chair. Grasp back of chair and press inward for 6 seconds. Repeat 4 more times. Perform this exercise as many times a day as possible.

   b. Doorway Press - Stand in a standard, one door doorway with elbows kept straight. Press outward for 6 seconds. Repeat 4 more times. Perform this exercise as many times a day as possible.

   c. Table Press - Stand erect. Grasp the corners of a table with arms straight and press inward for 6 seconds. Repeat 4 more times. Perform this exercise as many times a day as possible.

   d. Atlas Resister - Force fist into palm of opposite hand. Offer great resistance with the palm of the opposite hand for 6 seconds. Repeat 4 more times. Perform this exercise as many times a day as possible.

   e. Chair Breaker - Clasp your hands together at chest height and attempt to pull them apart for 6 seconds. Repeat 4 more times. Perform this exercise as many times a day as possible.

5. Shoulder Shrug - Shrug shoulder up, back, and down in a rotary motion. (3 sets of 15 reps, minimum of 3 times daily.)

6. Bench Exercises - Perform these exercises only when able to raise arm to shoulder level.

   a. Supine Arm Raise - Lying on bench on your back with the arm extended at shoulder level, raise arm to perpendicular position above the body. Lower to the starting position. (3 sets of 15 reps.)

   b. Prone Arm Raise - Lying on bench on your stomach with arm extended to the side at shoulder level, raise and lower the arm slowly holding it at a 90° angle to the body. (3 sets of 15 reps.)

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INTERMEDIATE EXERCISES To be performed only when you have obtained full range of motion in every possible shoulder motion.

1. Push-ups - Start with kneeling push-ups and progress to regular push-ups with back straight. Start with 10 reps and progress to 25-30 reps, 3 times daily.

2. Body Support - Support your body weight between arms of a sturdy chair, the backs of two sturdy chairs, or parallel bars for 6 seconds. Repeat 9 more times, 3 times daily.

3. Ape Drill with a Weighted-end Dumbbell - Perform the exercises in the Ape Drill except use a dumbbell with 2 pounds of weight on one end.

4. Progressive Resistance Exercises

For each of the following exercises, find the maximum weight that the athlete can lift in a single lift through the full range of motion of that exercise, then set up the following exercise system:

10 repetitions X 1/2 single lift capacity weight
10 repetitions X 3/4 single lift capacity weight
1-10 repetitions X single lift capacity weight

When able to lift the third set of exercises 10 repetitions, increase the single lift capacity weight 2 to 2 1/2 pounds.

a. Lateral Raises - This exercise is to be performed in the same manner as described in the range of motion exercises except for holding weights in the hand of the exercised arm. (Goal: 40 pounds.)

b. Forward Flexors - This exercise is to be performed in the same manner as described in the range of motion exercises except for holding weights in the hand of the exercised arm. (Goal: 40 pounds.)

c. Posterior Raises - This exercise is to be performed in the same manner as described in the range of motion exercises except for holding weights in the hand of the exercised arm. (Goal: 40 pounds.)

d. Rotation (inward and outward) - This exercise is performed with the athlete lying on his back, arm raised to shoulder level and elbow flexed to 90° (pointed up to ceiling). Maintaining this position, lower hand and weight forward towards the floor, return to starting position, lower backwards towards the floor, and return once again to starting position. (Goal: 20 pounds.)

e. Horizontal Flexion-Adduction - This exercise is performed with the athlete in a standing position and arm held extended laterally or sidewards at shoulder level. Keeping the elbow straight, pull the arm across the chest at shoulder level and then return to starting position. (Goal: 20 pounds.)

ADVANCED EXERCISES To be performed when you have obtained the goals set for the five progressive resistance exercises.

1. Weight Lifting Exercises (Barbell, Dumbbells or Universal Gym)

   a. Bench Press
   b. Overhead or Military Press
   c. Straight-Arm Pullover
   d. Lateral Raises, Supine or Bench
   e. Shoulder Shrugs
   f. Forearm Curls
   g. Bent-Over Rowing
   h. Lat Pulls
   i. Triceps Extensions

2. Crossbar Hang - Hang relaxed and fully extended from a crossbar for 30 seconds to a minute after every set of weight lifting exercises. No pull-ups.

3. Rope Skipping - Start with 5 minutes and progress to 10-15 minutes.

4. Punching Bag - Start with 5 minutes and progress to 10-15 minutes.

5. Swimming

OTHER EXERCISES

1. Prone Rotation - On stomach on bench, elbow flexed over edge of table, weight in hand, move forward, backward, and upward.

2. Wall and Overhead Pulley Weights

3. Shoulder Wheel

4. Towel Slide - Same position as drying back. One hand above shoulder, one behind opposite hip. Can vary range by adjusting hands on towel, likewise resistance can be changed. Head and neck erect throughout.

5. The Forcer - Palm of hand on back of neck. Lower hand sideward, rotating the arm as it moves down the back until the back of the hand is in contact with the buttocks. The opposite hand then slowly forces hand down buttocks, then brings original arm up to middle of the back.

6. Leaning Table - Hands on edge of table, feet well back, rock from side to side placing weight first on one shoulder then on the other.

7. All Fours - Weight on hands and feet, back parallel to floor, head up, walk forward and backward.

8. Crab Walk - Back to floor, abdomen flat, weight on hands and feet, walk forward and backward.

9. The Worm - Bend forward placing hands under shoulders (knees straight as possible), descend by walking forward on hands without bending knees until body is parallel and within a few inches of the floor. Then walk backward to starting position.

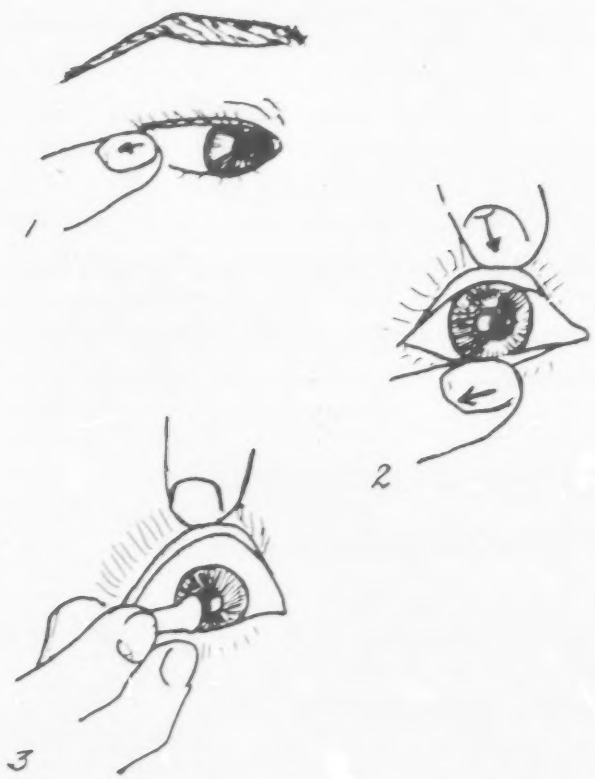
10. Shoulder Roller - Arms to side at shoulder level. Start with small circles (forward and backward, palm up and down) and increase diameter of circle. May also do exercise with arms to front of shoulder, and overhead.

11. Shoulder Swing - Straddle position, arms overhead, right hand touch outside rear of left heel. Throw opposite arm upward as high as possible. Repeat to other side.

CONTACT LENS EMERGENCY*

If possible, ask the victim to remove her own lenses. Most contact lens wearers, even injured, are far more adept at removing them.

If the lens is on the cornea (over the colored part and pupil of the eye) it can be removed in one of several ways. Remember -
1. The eye must be opened sufficiently so the lens can come out.
2. The lid margins should be used to pry the lens away from the eyeball.



Method 1
Place the fleshy side of the thumb between and against both eyelids. Keep the eye open and tighten the lids by pulling sideward. If possible, the victim should look straight ahead and then towards her nose or blink while the lids are pulled sideward.

Method 2
Place the tip of the middle finger of one hand at the center of the lower eyelid while pulling it sidewards and towards the ear. Then push the upper lid against the top edge of the lens to trigger it out. If possible, the victim should look straight ahead. Try to avoid rolling eye movements during the process.

Method 3
As an emergency measure, a lens may be removed with a suction cup - or, lacking one of these, the rubber end from a medicine dropper. Squeeze the suction cup as it is set flat against the lens surface, release the squeezing action slightly and lift the lens from the eye.

In any contact lens emergency consult the doctor.

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Bob Hand 181
Cal State Polytech College
Pomona, California

	HEAT STROKE (SUN STROKE)		HEAT EXHAUSTION
	Far more serious More men than women		Less serious More women than men
Factors contributing to cause	High Humidity Physical Exercise Elderly Persons	Overweight Young Persons Alcohol Addicts Body Weakness	Heart Disease
Causes	Exposure to excessive heat and high humidity		Exposure to excessive heat Loss of water and salt in blood circulation to cool the body
Signs and Symptoms	Red or purple	FACE	Pale
	Dry and very hot	SKIN	Moist, cold and clammy
	Little or no perspiration	SWEATING	Profuse
	As high as 109°F.	TEMPERATURE	Normal to subnormal: 95°-96°F.
	Fast	PULSE	Weak and rapid
	Could become unconscious, paralyzed, or may die	UNCONSCIOUSNESS	Could develop
First Aid	1. Move to shade and rest. 2. Cold bath or cold water thrown on athlete. COOL BRAIN FIRST. Must get temperature down to at least 102°F. 3. Rub wrists and sides of neck with ice. 4. Massage legs upward toward heart. 5. Take salt solution. 6. REST.		1. Move to shade and rest. 2. Take salt solution. 3. Maintain body temperature with hot water bottles or blankets. 4. If cramps develop, elevate limb, apply warm towels and massage. 5. REST.

STRAPPING

Tape is not the only answer. DO NOT tape a recently injured player just to get her back on the court. Start a rehabilitation program to strengthen the weakened joint or muscle against the stresses of the sport.

Strapping serves several purposes:
1. Retention of dressings in place.
2. Compression and/or retention of elastic wraps for compression.
3. Support for a new injury.
4. Limitation of joint movement.
5. Securing of protective devices.

In the female athlete, strapping techniques must be modified due to
1. Differences in body structure - less muscle bulk, smaller body parts, and more acute angles.
2. Anatomical barriers - breast tissue.

When strapping the trainer should consider[1]
1. Shape of the part - Does it taper?
2. Movement that is to be restricted.
3. Sport in which the athlete is participating.
4. Seriousness of the injury.
5. Sensitivity and condition of the skin.
6. Type of tape to use.
7. Length of time tape will remain in place.
8. Newness of the injury - expected swelling.
9. Proximity to muscle mass, nerves and blood vessels.

When strapping[2]
1. The athlete should hold the part in the position in which it is to be stabilized.
2. Over muscle, allow for contraction and relaxation of the muscle. Use elastic tape, or if white athletic tape is used, do not completely encircle the muscle mass with tape.
3. Overlap the tape 1/2 for stability.
4. Do not strap continuously.
5. For maximal support, tape directly to the skin.
6. Always start with anchor strips. Where the limb tapers, it is necessary to angle the tape ends upward. Start and end each strip on the anchor to avoid undue stress on the skin.

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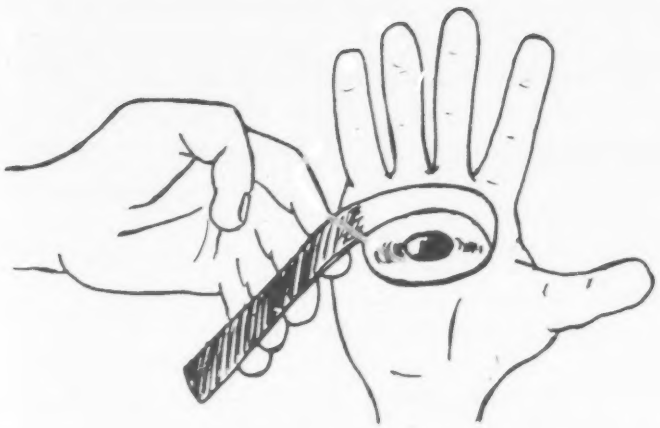
[1]David Matthews and Richard Thompson, Athletic Injuries, A Trainer's Manual and Textbook (Dubuque, Iowa: Wm. C. Brown, 1963), pp. 107-09.

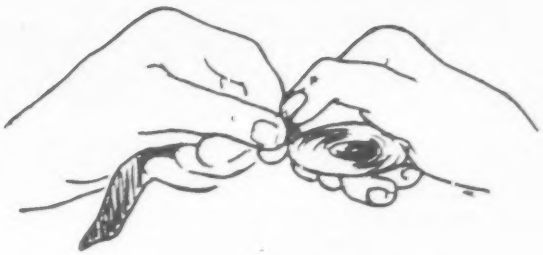
[2]Adapted from Klafs, Carl E., and Arnheim, Daniel D.: Modern principles of athletic training, ed. 3, St. Louis, 1973, The C.V. Mosby Co.

7. Use narrower tape for more acute angles and smaller body parts.
8. Mold the tape to the skin so it conforms to the contours - angle tape on tapering limbs.
9. Keep the tape close to the roll and the roll close to the skin. It is difficult to work with tape that has been unwound.

TEARING TAPE



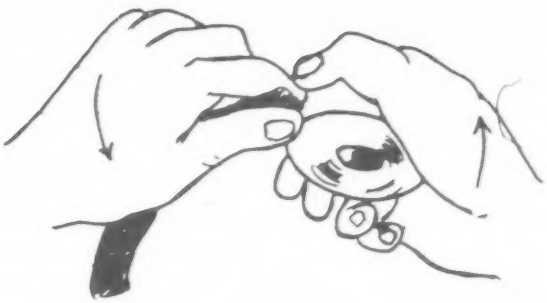
1. Hold the tape between the thumb and index finger of both hands. The thumbs should be close together.



2. Push with one hand and pull with the other. Keep the wrists firm.

Note: Do not bend over the edge of the tape.

Tear with the fingers rather than the fingernails.



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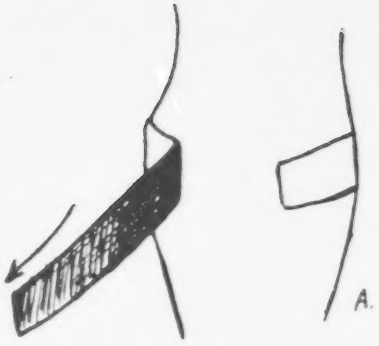
REMOVAL OF TAPE

Tape should not be yanked or torn off the skin. A

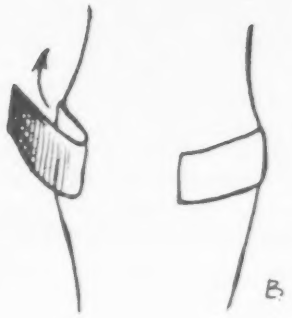


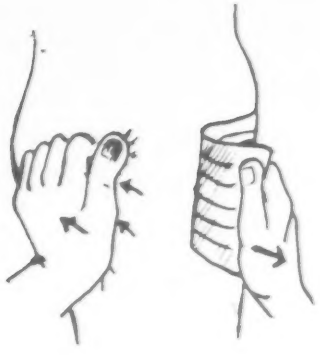
There are two techniques that can be used to remove tape.

1. Saturate the tape with tape remover to loosen the tape from the adherent.
2. Peel the tape off the skin.

or

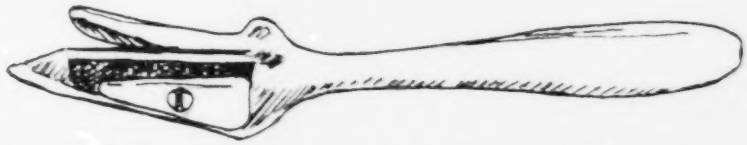
1. Cut the tape off with a tape cutter.
2. Gently pull the tape back in line with the skin. Push the skin down with the opposite hand as you pull the tape back.
3. Remove tape adherent from the skin with tape remover.
4. Use soap and water to remove residue.





USE OF THE TAPE CUTTER

To remove tape from an ankle use a tape cutter.

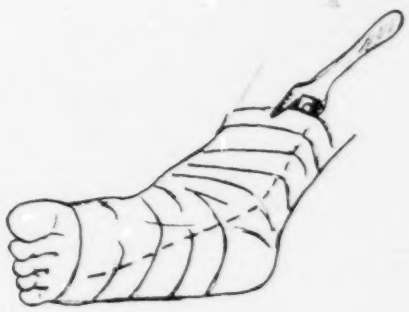


1. Apply a lubricant to the tip of the cutter.
2. Start on the inside of the leg.
3. Cut down the leg, behind the malleolus (ankle bone), and along the sole of the foot.

Note: If you cut along the outside of the leg you might nick the little toe.

There is little chance of cutting yourself if you use the cutter correctly. Do not put the fingers of your opposite hand in the path of the cutter.

Do not use scissors to cut off a strapping because they will become dull quickly.



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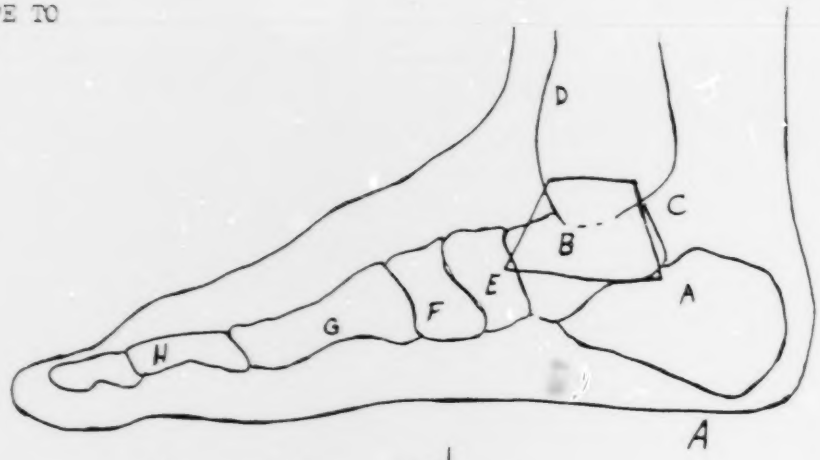
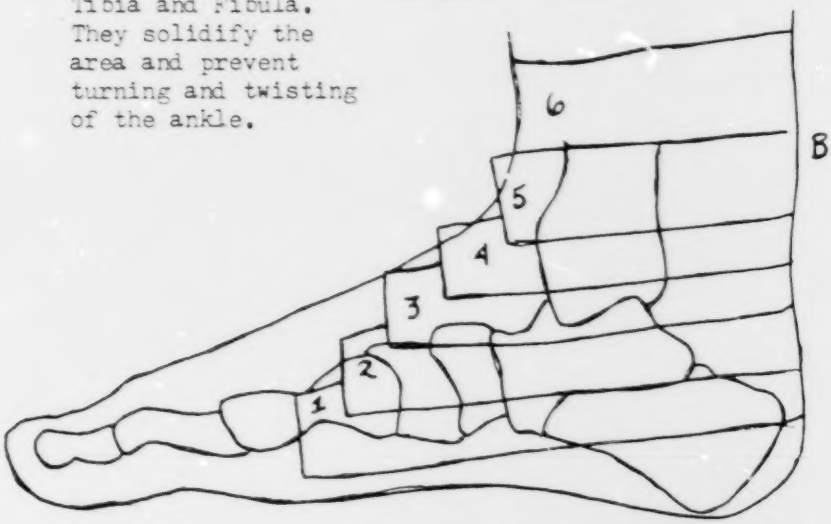
RELATIONSHIP OF THE TAPE TO
THE BONES OF THE ANKLE

A - Calcaneus
B - Talus
C - Deltoid Lig.
D - Med. Malleolus
E - Navicular
F - Cuneiform
G - Metatarsals
H - Phalanges

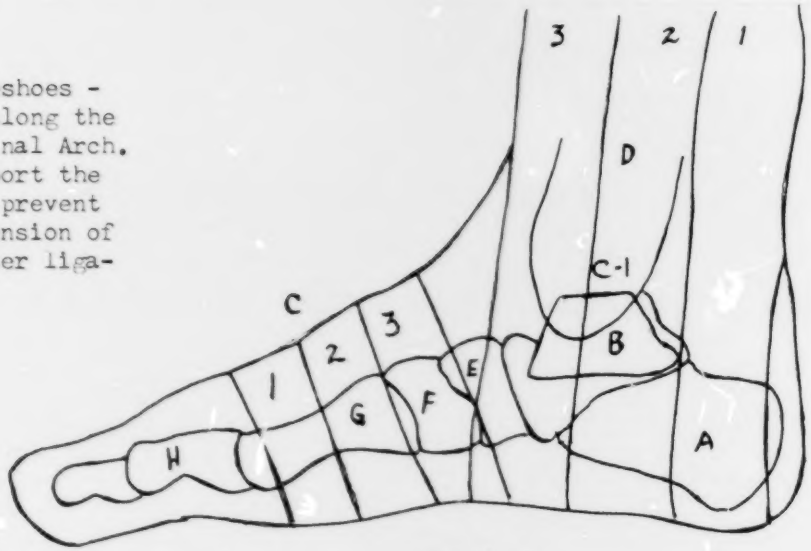


A. The Stirrups - Applied to the Tibia and Fibula. They solidify the area and prevent turning and twisting of the ankle.



C. The Arch Support - Circular strips applied around the Metatarsal Bones to support the Metatarsal Arch.

B. The Horseshoes - Applied along the Longitudinal Arch. They support the arch and prevent over-extension of the planter ligaments.



CLOSED BASKETWEAVE - INVERSION SPRAIN
(Sole of foot turned inward)

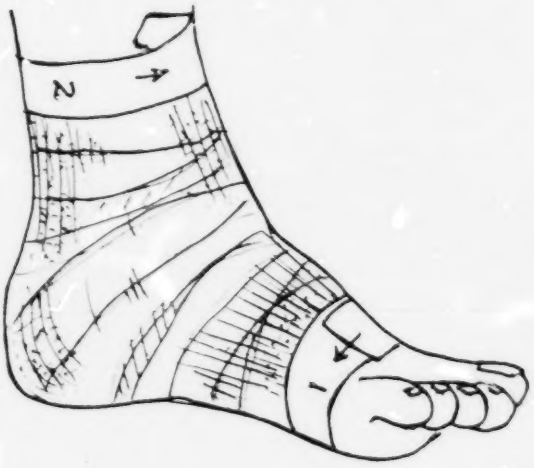
Materials Needed: Tape adherent, underwrap, 1½" athletic tape.

Preparation:

1. Instruct the athlete to hold her foot at a right angle throughout the strapping process.

2. Spray or paint the entire area with tape adherent and allow to dry. If desired, cover with underwrap.

Strapping:



1. Apply an anchor strip (1) loosely around the sole of the foot. The tape must be in contact with the skin to secure the underwrap. Remember, the foot will flatten out when weight is borne. Place the anchor behind the head of the fifth metatarsal (little toe side) to avoid irritating the joint.

2. Apply an anchor strip (2) around the shin just below the belly of the muscle (gastrocnemius). Angle the tape ends upward to conform with the taper of the leg. The tape must be in contact with the skin to secure the underwrap.

3. First Stirrup (3). Start on the inside of the leg at the anchor strip. Go down the inside of the leg behind the ankle bone (malleolus), around the heel, and up the outside of the leg behind the ankle bone (malleolus). End on the anchor strip. Pull upward to counteract the force of gravity as you bring the tape around the heel.

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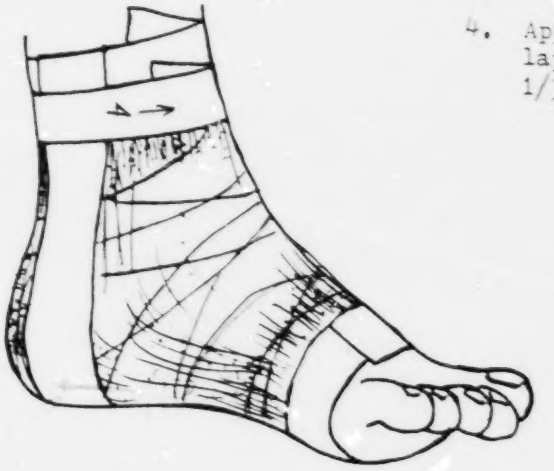
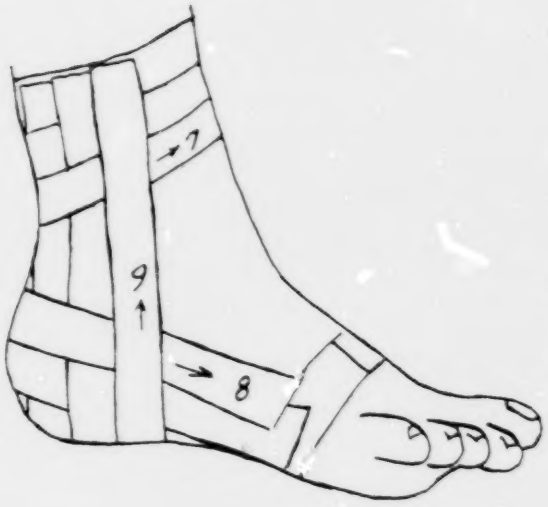


4. Apply an anchor strip (4), overlapping the initial anchor by 1/3 - 1/2 and angling upward.

5. First Horseshoe (5). Start on the heel as close to the sole of the foot as possible. Pull the ends of the tape forward toward the toes and slightly downward toward the sole of the foot. End the tape on the anchor. Angling the tape downward will conform it to the taper of the heel.



6-11. Complete the stirrup, anchor, horseshoe pattern two more times.

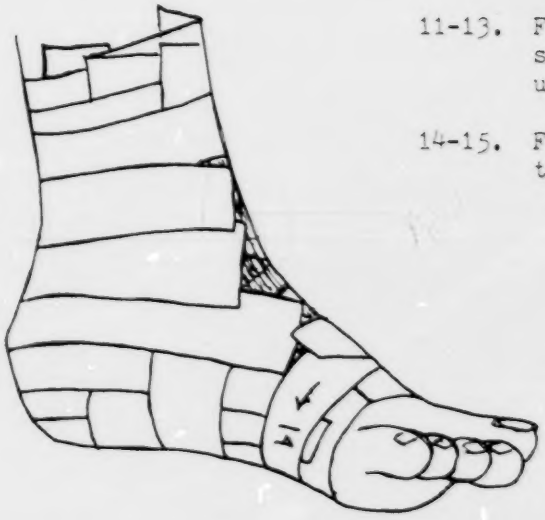
a. The tape should overlap 1/3 - 1/2 of the previous piece.

b. The second stirrup covers most of the ankle bone (malleolus) and the third stirrup the rest of it.

c. Keep the stirrups within the heel area to avoid undue stress on the longitudinal arch.

d. The anchors angle upward.

e. The horseshoes start on the heel with the tape ends angling slightly downward toward the sole of the foot. Each succeeding horseshoe should be shorter than the previous one. This stair step effect leaves the shoe lace area free of tape. Too much tape in this area would limit the normal range of motion - plantar and dorsal flexion.

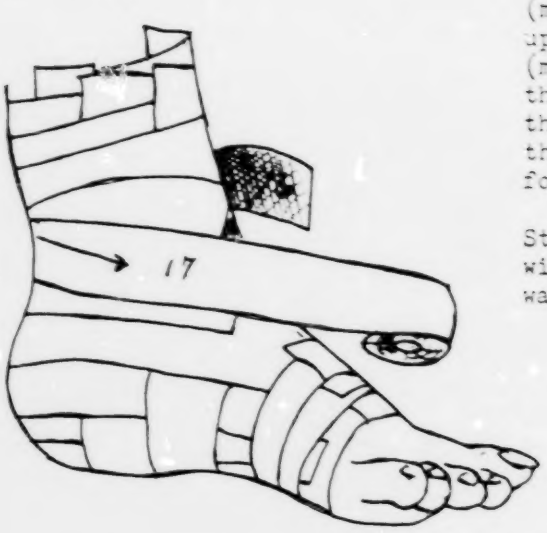


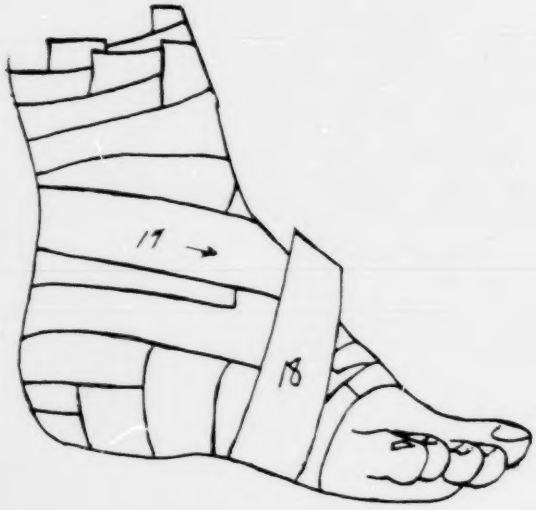
11-13. Fill in the lower leg with anchor strips. Angle the tape ends slightly upward and overlap 1/3 - 1/2.

14-15. Fill in the arch (14). Apply the tape loosely around the foot.

16-18. Figure 8. Start on the inside of the leg with the roll of tape. Place the end of the tape (16) just below the medial ankle bone (malleolus) and angle the tape upward across the ankle bone (malleolus). Loop the tape around the back of the leg and come across the top of the foot (17). Encircle the arch and end on the top of the foot (18).

Starting on the inside of the leg will pull the sole of the foot outward to a position of eversion.





19. First Heel Lock. Start on the inside of the leg at the anchor strip. Angle the tape downwari across the front of the shin. Loop the tape around the back of the leg just above the heel (19). Angle the tape downward to catch the medial edge of the heel. End on the inside of the leg (19).

20. Second Heel Lock. Follow the same pattern as the first, but start on the outside of the leg to catch the lateral side of the heel (20).

21-22. Finish the strapping with lock strips. Start on the leg just below the belly of the muscle (gastrocnemius). Overlap 1/3 - 1/2.

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OPEN BASKETWEAVE - INVERSION SPRAIN

This strapping is used after the immediate ice treatment to provide compression and support.

Materials Needed: Tape adherent, 1½" athletic tape, gauze sponges, lubricant, vinyl foam horseshoe.

Preparation:

1. Instruct the athlete to hold her foot at a right angle throughout the strapping process.

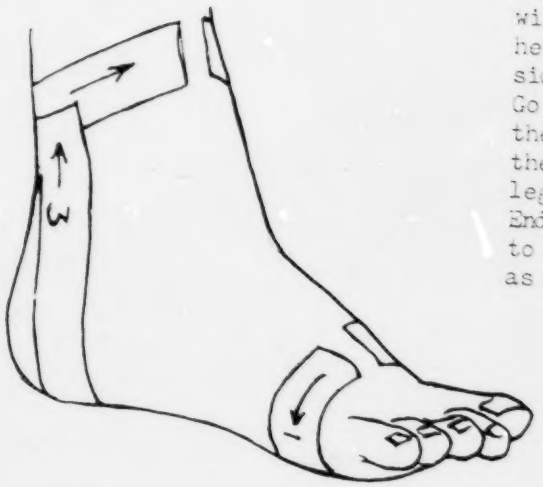
2. Spray or paint the entire area with tape adherent and allow to dry.

Strapping: Tape directly to the skin.

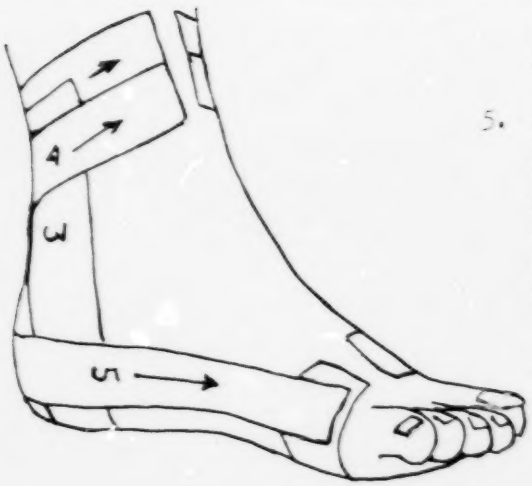
1. Apply an anchor strip (1) loosely around the sole of the foot. Leave the tape open approximately 1 inch on the top of the foot. Place the anchor behind the head of the fifth metatarsal (little toe side) to avoid irritating the joint.

2. Apply an anchor strip (2) around the shin just below the belly of the muscle (gastrocnemius). Angle the tape ends upward to conform with the taper of the leg. Leave the front of the leg open approximately 1 inch.

If desired, place a vinyl foam horseshoe around the lateral ankle bone (malleolus) to aid in compression.

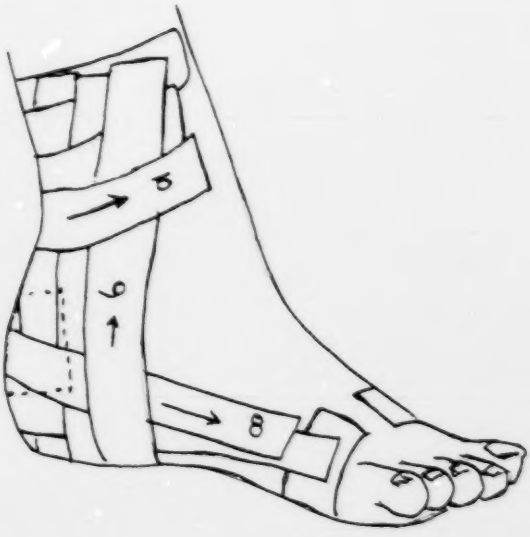


3. First Stirrup (3). Before applying the stirrup, place a gauze sponge with lubricant on it just above the heel. Start the stirrup on the inside of the leg at the anchor strip. Go down the inside of the leg behind the ankle bone (malleolus), around the heel, and up the outside of the leg behind the ankle bone (malleolus). End on the anchor strip. Pull upward to counteract the force of gravity as you bring the tape around the heel.



4. Apply an anchor (4), overlapping 1/3 - 1/2 and angling upward. Leave the front of the leg open approximately 1 inch.

5. First Horseshoe (5). Start on the heel as close to the sole of the foot as possible. Pull the ends of the tape forward toward the toes and slightly downward toward the sole of the foot. End on the anchor.



6-11. Complete the stirrup, anchor, horseshoe pattern two more times.

a. The tape should overlap 1/3 - 1/2 of the previous piece.

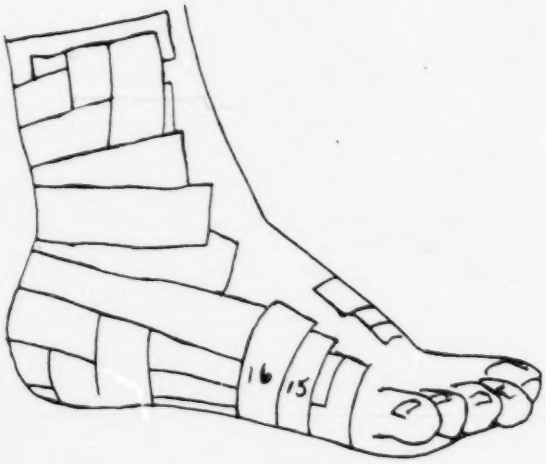
b. The second stirrup covers most of the ankle bone (malleolus) and the third stirrup (9) the rest of it.

c. Keep the stirrups within the heel area to avoid undue stress on the longitudinal arch.

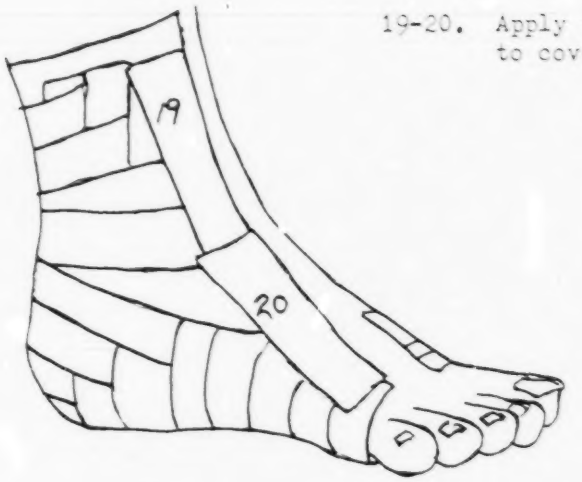
d. The anchors (10) angle upward but do not cover the front of the leg.

e. The horseshoes (8) start on the heel with the tape ends angling slightly downward toward the sole of the foot. Each succeeding horseshoe should be shorter than the previous one to give a stair step effect.

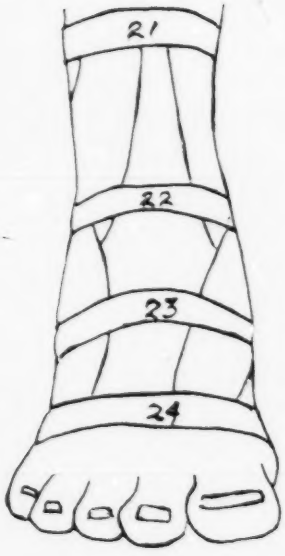
12-14. Fill in the lower leg with anchor strips (14). Leave the front of the leg open.



15-18. Fill in the arch (15, 16), but leave the top of the foot open.



19-20. Apply two tape strips on each side to cover the tape ends.



21-24. Apply one-half lock strips across the top of the foot and the front of the leg. They do not encircle the foot or leg.

One-half heel locks may be applied for increased stability. Do not cross the front of the leg or the top of the foot with tape.

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ARCH STRAPPING

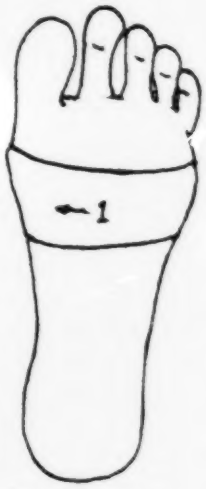
Materials Needed: Tape adherent, 1½" athletic tape.

Preparation:

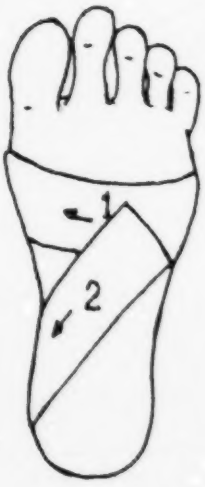
1. Instruct the athlete to hold her foot at a right angle throughout the strapping process.

2. Spray or paint the area with tape adherent.

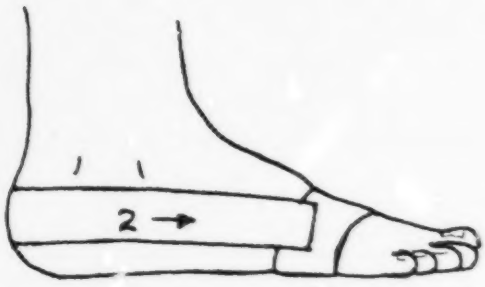
Strapping:

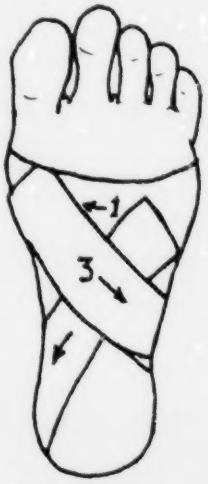


1. Apply an anchor strip (1) loosely around the foot. The foot will spread out when weight is borne.

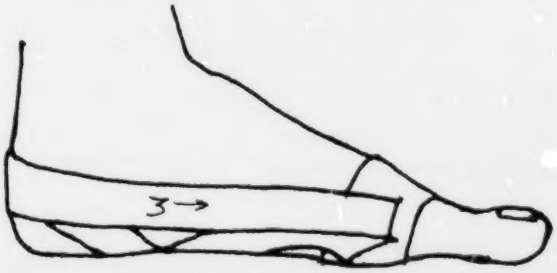


2. Start at the anchor on the sole of the foot. From the little toe side, angle the tape across the sole, around the heel and along the little toe side of the foot as close to the sole as possible (2). End on the anchor strip.





3. Start at the anchor on the sole of the foot. From the big toe side, angle the tape across the sole, around the heel and along the big toe side of the foot as close to the sole as possible (3). End on the anchor strip.



4. Apply 2-3 lock strips loosely around the foot. Start at the anchor and go toward the heel. Overlap 1/3 - 1/2. The foot will spread out when weight is borne.

5. If necessary, apply arch pads.

PLACEMENT OF ARCH PADS

Materials Needed: Commercially made arch pads, vinyl foam or felt.

Metatarsal Pad (shaded)

1. Instruct the athlete to hold her foot at a right angle throughout the strapping process.
2. Spray or paint the area with tape adherent and allow to dry.
3. Place the pad on top of metatarsal heads 2-4.
4. Hold the pad in place with tape strips applied loosely around the foot. Overlap 1/3 - 1/2. The foot will spread out when weight is borne.

It is easier to tape the arch first and then apply the pad.

Longitudinal Pad

1. Follow steps 1-2.
2. Determine the midpoint of the third toe and the heel. Connect the two points with a straight line.
3. Place the edge of the pad along the guideline on the medial side of the foot. The pad should cover the entire inner longitudinal arch from the ball of the foot to the front edge of the heel. It should curve around the inner edge of the foot.
4. Hold the pad in place with tape strips applied loosely around the foot. Overlap 1/3 -1/2. The foot will spread out when weight is borne.

It is easier to tape the arch first and then apply the pad.

SHIN SPLINTS STRAPPING

Materials Needed: Tape adherent, 1½" athletic tape, 1½" or 2" elastic tape.

Preparation:

1. Instruct the athlete to hold her foot at a right angle throughout the strapping process.

2. Spray or paint the area with tape adherent and allow to dry.

Strapping: Always strap the arch first.

1. Apply a strip of tape along the inside of leg from 1 inch above the ankle bone (malleolus) to within 3 inches of the knee.

2. Apply a strip of tape along the outside of the leg following the same pattern.

<u>or</u>

3. Apply a <u>long</u> stirrup from the inside of the leg to the outside of the leg. Start approximately 3 inches below the knee and end approximately 3 inches below the knee. The stirrup is a more stable anchor.

4. Start at the anchor strip on the inside of the leg. Angle the tape upward across the shin and end on the other anchor on the outside of the leg (1). Pull the tape tightly across the shin.

5. Start at the anchor strip on the outside of the leg. Angle the tape upward across the shin and end on the other anchor on the inside of the leg (2). Pull the tape tightly across the shin.

The center of the "X" should be directly over the point of maximum tenderness.

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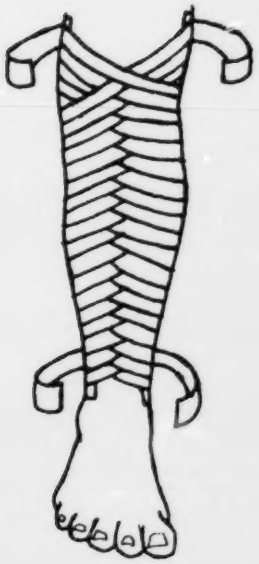


6. Continue the "X" pattern up the shin, overlapping 1/3 - 1/2. Pull the tape tightly across the shin.

   The back of the leg is left open to allow for contraction and relaxation of the muscle (gastrocnemius).

7. Apply a strip of tape down each side of the leg to cover the tape ends.

8. Apply lock strips around the leg, just above the ankle and just below the knee. Use elastic tape.

KNEE STRAPPING

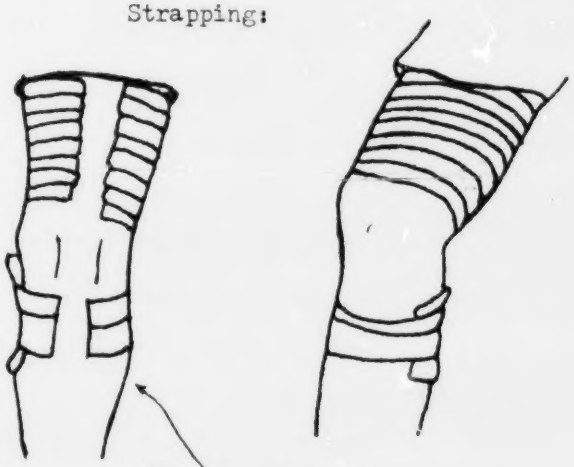
Materials Needed: Tape adherent, 1½" athletic tape, 2" elastic tape, gauze sponges.

Preparation:

1. If the athlete is standing, place a lift under the heel to flex the knee at approximately a 15° angle. This position will relax the medial collateral ligaments and provide greater freedom of movement after the strapping is completed.

2. Spray or paint the entire area with tape adherent and allow to dry.

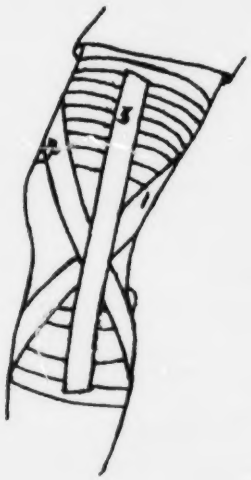
Strapping:



The gauze sponge has been cut away.

1. Apply anchor strips to the thigh and lower leg. Overlap 1/3 - 1/2. Leave the strips open on the back of the leg to allow for contraction and relaxation of the muscles. Angle the tape to conform with the taper of the leg. A gauze sponge may be placed behind the knee to prevent skin irritation.

Tape the medial side of the knee first and, if necessary, repeat the pattern on the lateral side.



2. Start on the anchor strips on the thigh close to the posterior aspect. Angle the tape (1) across the medial side of the knee and end on the lower anchor strips on the lateral side of the knee.

3. Start on the anchor strips on the lateral side of the thigh. Angle the tape (2) across the medial side of the knee and end on the lower anchor strips on the posterior aspect.

The center of the "X" should be directly over the joint line.

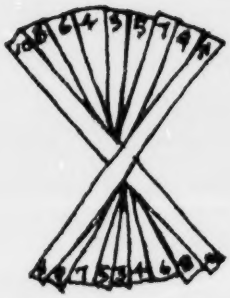
4. Bisect the "X" with a strip of tape (3). Start at the anchor strips on the thigh and end on the lower anchor strips.

5. Start on one side of the bisecting strip and angle the tape across to the opposite side of the bisecting strip (4).

6. Start on the other side of the bisecting strip and angle the tape across to the opposite side of the bisecting strip (5).

7. Start on the outside edge of tape strip 4 and angle the tape across to the opposite side of tape strip 4.

8. Start on the outside edge of tape strip 5 and angle the tape across to the opposite side of tape strip 5.



9. Continue the weaving pattern until the butterfly is filled in.

10. Repeat the butterfly pattern again directly on top of the first.

11. Tape the lateral side of the knee if necessary.

12. Apply lock strips at the thigh and lower leg with $1\frac{1}{2}$" athletic tape. Leave the back of the leg open.

13. Encircle the thigh with elastic tape starting at the top of the anchor strips and ending above the kneecap.

14. Encircle the lower leg with elastic tape starting at the bottom of the anchor strips and ending below the kneecap.

THUMB STRAPPING

Materials Needed: Tape adherent, 1½" athletic tape, 2" non-sterile roller gauze, 1" elastic tape.

Preparation:

1. Hold the thumb in the position in which it is to be stabilized. Spread the fingers.

2. Spray or paint the area with tape adherent and allow to dry.

Strapping:

1

1. Start on the outside of the thumb at the wrist with 1½" athletic tape. Angle the tape ends upward. End at the middle of the palm and the middle of the back of the hand.

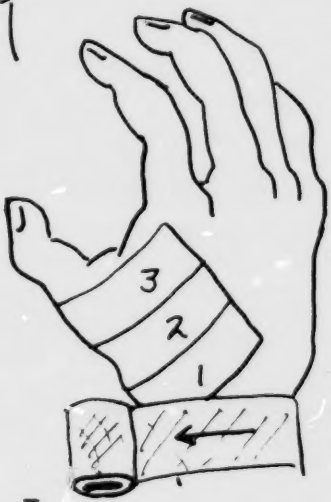
2. Repeat the pattern two more times. Overlap 1/3 - 1/2.

The first and second joints of the thumb should be covered with tape.

3. Wrap the roller gauze around the wrist 2-3 times.

2

4. Angle the gauze across the back of the hand, loop it around the thumb and back to the back of the hand. Do not pull too tightly or the circulation may be cut off.



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5. Loop the gauze around the hand to the palm side.

6. Angle the gauze across the palm of the hand, loop it around the thumb and back to the palm of the hand. Do not pull too tightly or the circulation may be cut off.

7. Loop the gauze around the hand to the back of the hand.

8. Repeat steps 4 - 6 twice.

9. Follow steps 3 - 6 with elastic tape. End by encircling the hand from the wrist to the second joint of the thumb with elastic tape.

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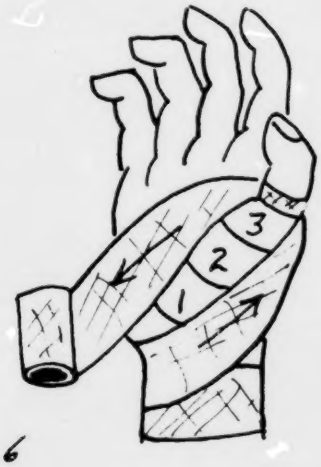

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GYMNASTICS RIPS

This strapping is used to protect as well as prevent rips.

Materials Needed: Tape adherent, 1½" athletic tape, 2" Elastikon or 2" J-Flex.

Preparation:

1. If the palm has been ripped, clean out the chalk with soap and water. Apply hydrogen peroxide as a final cleansing process. There are several methods of covering the wound.

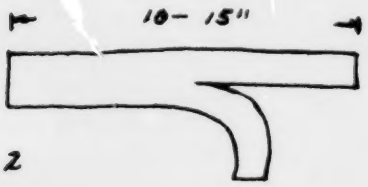
   a. Paint the area with New Skin to seal it off.

   b. Paint the area with tape adherent (painful), allow to dry, and cover with a piece of athletic tape slightly larger than the rip.

   c. Apply first aid cream or an antibiotic, if the depth of the injury warrants it. Cover with a small piece of sterile gauze and bandage with 1" Elastikon by encircling the hand with tape.

2. Spray or paint the wrist with tape adherent and allow to dry. Spread the fingers throughout the strapping process.

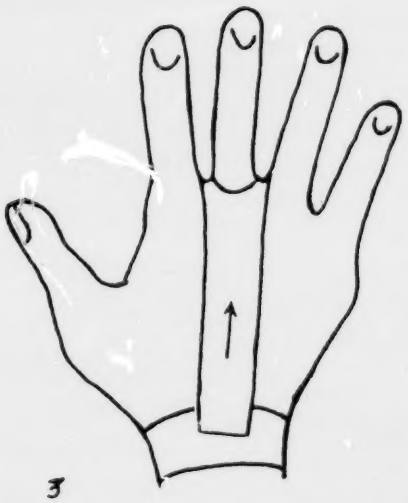
Strapping:



2

1. Apply an anchor strip of 1½" tape around the wrist.

2. Split one end of a piece of 1½" tape so there are two tails on one end. The piece of tape should be 10 - 15 inches long.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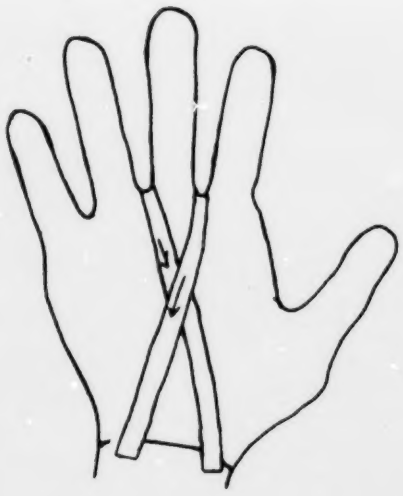
3. Place the solid end of the tape on the back of the hand at the wrist anchor strip. Criss-cross the two tails over the ripped area. End on the anchor strip on the palm side of the hand.



3

4. Cut a piece of 2" Elastikon, long enough to cover both the front and back of the hand when stretched.

5. Fold the Elastikon non-sticky side to non-sticky side and cut two small triangles out of the folded edge.

5

6. Slip the third and fourth fingers through the triangles.

7. Pull the Elastikon back along the back of the hand so the edges of the triangles are as close to the base of the fingers (palmar surface) as possible. This provides more protection for the palm.

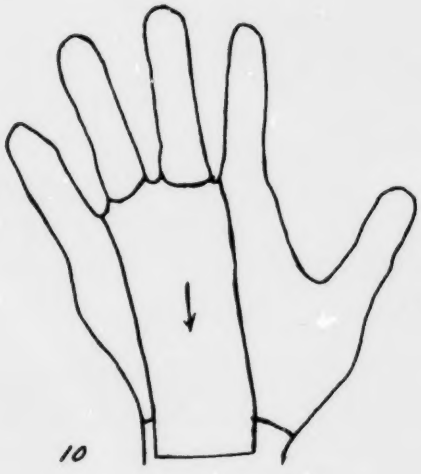
7

8. End the Elastikon on the back of the hand at the wrist anchor.

9. Cup the hand slightly.

10. Stretch the Elastikon slightly across the palm and end on the wrist anchor.

11. Anchor the tape ends by applying a strip of $1\frac{1}{2}$" tape around the wrist. Make sure the gymnast has her fingers spread.



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Leather hand grips may be worn over the tape grips for additional protection; however, some gymnasts find both are too bulky and they lose their grip.

Some gymnasts substitute J-Flex for the Elastikon because it is thinner but stronger. Others eliminate the criss-cross strip of tape.

QUADRICEPS STRAIN

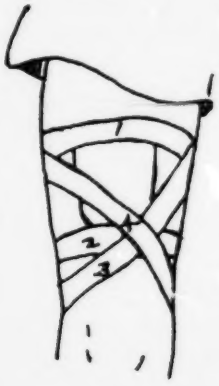
Materials Needed: Tape adherent, 1½" athletic tape, vinyl foam, "live rubber wrap" or two 4" elastic wraps, 4" elastic wrap, 2" elastic tape.

Preparation:

1. Place a lift under the athlete's heel.

2. Spray or paint the area with tape adherent and allow to dry.

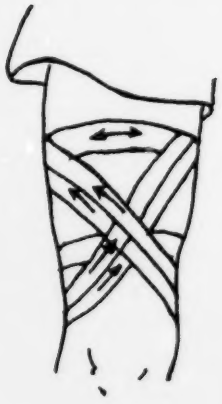
Strapping:



1. Place a vinyl foam pad over the strain and hold it in place with two anchor strips (1,2).

2. Start on the lateral side of the thigh and angle the tape upward across the pad (3). End on the medial side of the thigh on the anchor strip.

3. Start on the medial side of the thigh and angle the tape upward across the pad (4). End on the lateral side of the thigh on the anchor strip.



4. Repeat the weaving "X" pattern until the front of the thigh is covered. Pull upward and overlap 1/3 - 1/2.

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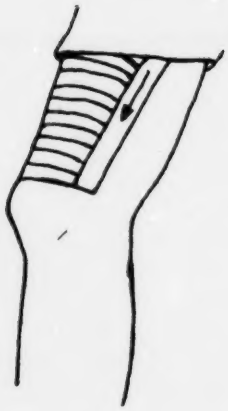
5. Apply lock strips starting at the bottom of the thigh. From the front of the thigh angle the tape ends slightly upward toward each side. Leave the back of the thigh open and overlap 1/3 - 1/2.

6. Apply a lock strip down each side of the leg to cover the tape ends.



7. Cover the strapping with a "live rubber wrap" or two 4" elastic wraps. Encircle the thigh 2-3 times and then go up around the waist to complete a figure 8 pattern.

If you use a "live rubber wrap" do not anchor the wrap with tape. First repeat the figure 8 pattern with a 4" elastic wrap and then with elastic tape. Encircle the thigh 2-3 times with elastic tape after going around the waist.

If you use two 4" elastic wraps for the figure 8 pattern, follow the pattern with elastic tape to anchor. Encircle the thigh 2-3 times with elastic tape after going around the waist.

HAMSTRINGS STRAIN

This strapping is used to restrict extension of the leg.

Materials Needed: Tape adherent, 1½" athletic tape, gauze sponges or combine, 2" elastic tape, vinyl foam.

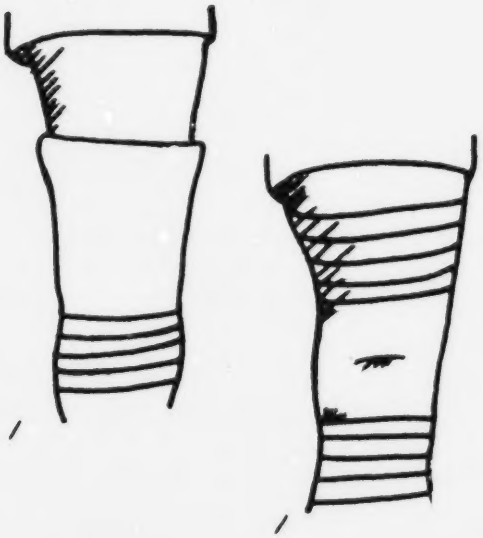
Preparation:

1. Elevate the heel on a lift.

2. Spray or paint the area with tape adherent and allow to dry.

Strapping:

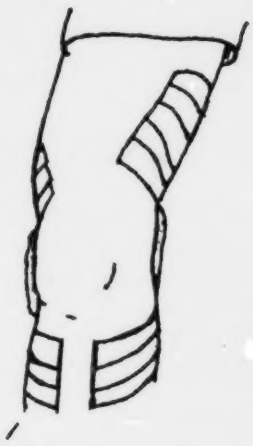
1. Pad the back of the knee with a piece of combine or a gauze sponge. Hold the pad in place with several anchor strips. Angle the tape to fit the contour of the leg. Overlap 1/3 - 1/2 and leave the front of the leg open.



2. Start on the lower leg anchors and run a piece of tape vertically upward to the anchor strips on the thigh. The slack in the tape will determine the amount of extension possible. The less slack, the more extension is restricted.

3. Start from one edge of the vertical strip and cross diagonally upward to the opposite edge of the vertical strip.

4. Start from the other edge of the vertical strip and cross diagonally upward to the opposite edge of the vertical strip.

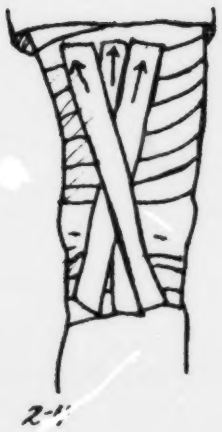


5. Repeat the pattern again directly on top of the first.

6. Apply lock strips to the lower leg and thigh. Angle the tape to fit the contour of the leg. Overlap 1/3 - 1/2 and leave the front of the leg open.

7. Encircle the lower leg with elastic tape from the bottom of the anchor strips to just below the kneecap.

8. Encircle the thigh with elastic tape from the top of the anchor strips to just above the kneecap.



9. Tape a 1/4" vinyl foam lift to the athlete's heel. Use elastic tape and follow a figure 8 pattern. Place a gauze sponge on the shoe lace area to avoid irritation of the tendons.

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Part 5 Conditioning

I. Purpose of Conditioning

A. Prevention of Injuries

B. Improvement of Performance

C. Improvement of Health

II. Components of Physical Fitness

A. Strength

1. Definition

2. Methods of Building Strength

a. Isotonic Exercise

b. Isometric Exercise

c. Weight Training

(1) Definition

(2) Physiological Benefits

(3) DeLorme Theory

(4) Safety Regulations

B. Endurance

1. Definition

2. Methods of Building Endurance

a. Aerobics

b. Circuit Training

c. Fartlek

d. Interval Training

e. Vita Parcours

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C. Flexibility

1. Definition

2. Methods of Gaining Flexibility

a. Static Stretching vs. Dynamic Stretching

b. Partner Stretching

c. Precautions: Muscle Spasms Or Tearing

Too Much Flexibility Affects Joint Stability

III. Controversial Exercises

A. Duck Walk, Deep Knee Bend, Russian Bounce, Squat Thrust

B. Straight Leg Sit-up

C. Double Leg Lift

D. Hyperextension of Hip

E. Straight Leg Toe Touch

F. Toe Rise

IV. Warm Up

A. Physiological Benefits

B. Psychological Benefits

C. Injury Prevention

V. Areas of Concentration for Specific Sports

A. Field Hockey

1. Strength

a. Ankles

b. Knees

c. Abdominal Region

d. Wrists

2. Endurance

a. Cardiovascular

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b. Tolerance - Anaerobic

3. Flexibility - General

B. Volleyball

1. Strength

a. Wrists

b. Fingers

c. Knees

2. Flexibility

a. Hamstrings

b. Quadriceps

3. Endurance - Aerobic

C. Basketball

1. Strength

a. Ankles

b. Knees

c. Wrists

d. Fingers

2. Flexibility

a. Shoulders

b. Hamstrings

c. Quadriceps

3. Endurance - Aerobic

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CONDITIONING PROGRAM FOR FIELD HOCKEY

Prior to the actual timing of the hockey circuit, the player should do the following exercises.

1. 10 Bent Knee Sit-ups
   a. Lie supine on the ground with the knees bent and the hands clasped behind the neck.
   b. Lift the head, then the shoulders and finally the back, one vertebrae at a time, off the ground.
   c. Stretch forward between the knees.
   d. Return to starting position by uncurling the trunk one vertebrae at a time.

   Note: Do not hold your breath during execution of the exercise.

2. 10 Gastrocnemius Stretches
   a. Stand an arm's length from a wall with the hands at shoulder height touching the wall.
   b. Lean forward by bending the elbows. Keep the back straight.
   c. Take a step forward with one foot while the other foot remains in contact with the ground.
   d. Straighten the elbows to return to starting position and take a step back with the forward foot.
   e. Repeat but step forward with the opposite foot.

3. 10 Knee Curls
   a. Lie supine with the legs extended.
   b. Bend one knee and pull it to the chest with your hands.
   c. Hold for a count of three and lower leg to starting position.
   d. Repeat with opposite leg.

4. 5 Hamstring Stretches
   a. Sit with the legs spread in a "V" position.
   b. Bend forward attempting to touch the chest to the ground.
   c. DO NOT BOUNCE.
   d. Hold for a count of three and relax.
   e. Attempt to bend farther forward.
   f. Return to starting position and repeat.

5. 5 Wrist Rolls - requires a dowel with a $2\frac{1}{2}$ pound disc weight suspended from it by a rope.
   a. Stand with arms extended at shoulder height and hands holding dowel.
   b. Roll the weight up slowly and then roll it down slowly.

Hockey Circuit: Manager calls out the time and athlete attempts to improve her time each time she runs the circuit.

1. Run 1 lap around the outside of the field carrying a stick.
2. Run 1 lap around the outside of the field dribbling the ball.

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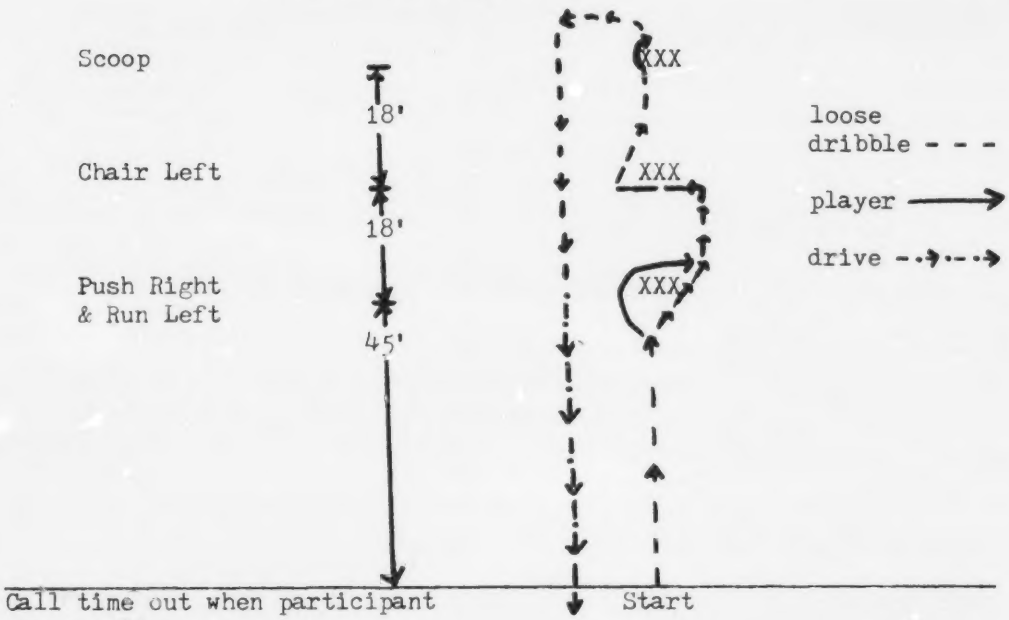
3. 30 Toe Rises
   a. Stand on 2X4 facing fence. Hold onto fence to stabilize body.
   b. Raise up on toes slowly.
   c. Lower body slowly so the heels are below the edge of the board.
   d. Return to starting position - heels even with board.
   e. Repeat - up and down counts as one.
4. 25 Grasshoppers
   a. Assume a push up position with the right leg bent forward so the knee is under the chest.
   b. Simultaneously exchange positions of the legs so the left leg is forward and the right leg is back in extended position.
   c. Alternate legs as quickly as possible.
   d. Each time exchange is made counts as one.
5. Walk 30 steps on the outside borders of the feet, 30 steps on the heels, and 30 steps on the inside borders.
6. Sprint 50 yards or 1/2 the field. Walk 50 yards. Sprint 50 yards and walk 50 yards.
7. 10 Ball Scoops
8. 10 Air Dribbles
9. Obstacle Course: Start at line and dribble the ball 38+ times to the first obstacle. If necessary, dribble in a small circle to have 38 by the time you reach the obstacle.



Other conditioning activities to use outside of practice include: 1) Running 1-2 miles a day, 2) Jumping Rope (2 foot take off) - start with 50 and increase by 10 to 150, 3) Marble or Towel Pick Up, and 4) Knee and Ankle Machine.

Part 6 Report Forms and Legal Liability

I. Report Forms

A. Injury Report

1. Standardized Form

2. File for Future Reference

a. Insurance Claims

b. Injury Prevention

c. Liability

B. Running Log

C. Injury Description

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D. Medical Report - From Team Physician

E. Medical Report - To Coach

F. Inactive List

G. Athlete's Instruction Sheet

H. Weight Chart

1. Record of Water Loss During Activity

2. Loss of 3-5 Pounds/ Practice - Dangerous

II. Legal Liability

A. High Risk Activity - Athletics

B. Negligence

1. Definition

2. Common Sense Approach

C. Safeguards

1. Supervision of Training Room

2. Distribution of Medical Supplies

3. Recognition of Limitations

a. Modalities

b. Player Release

c. School Policy

4. Recognition of Athlete's Needs

a. Medical History

b. Pain Tolerance

5. Maintenance of Accurate, Up-to-Date Records

6. Athletic Insurance

7. Liability Insurance (AAHPER)

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INJURY INSTRUCTION SHEET - INDIANA STATE

Inflammation follcwing an injury -

When an acute injury occurs, the blood vessels in the area constrict momentarily, decreasing the amount of blood in that area. This short-lived constriction is followed by a dilation of the capillaries, thus engorging them with blood. The extra blood fluid leaks into the surrounding tissues and causes swelling. Swelling causes pressure on the nerve endings in the area. This results in pain. The displaced blood also causes the discoloration associated with an injury such as a sprain or bruise.

First Aid Treatment

The main purpose of the first aid treatment is to limit the amount of swelling and reduce the accompanying pain. Swelling is decreased by the application of cold. Cold immediately constricts the superficial blood vessels. This prevents most of the blood fluid leakage and aids in clot formation to seal off the wound. Consequently, pain is decreased because there is less pressure on nerve endings due to the control of swelling. The cold application also reduces pain by acting as an anaesthetic. It interferes with the nervous transmission of pain impulses.

1. Examine the injured part to determine the severity of injury.
2. Apply a wet elastic wrap to compress the injured area. The wetness conducts the cold to the tissues faster.
3. Apply an ice pack to the injury to constrict the blood vessels in the area. Fill a wet towel with ice and fold into a pack.
4. Hold the pack in place with a dry elastic wrap.
5. Elevate the injured part to decrease swelling and aid in the drainage of the part.
6. If perscribed, take the oral enzyme (Ananase) to decrease swelling - 2 every 4 hours.

DO NOT apply heat in any form during the first 24-72 hours following the injury. Apply ice to the injured area as often as possible. Keep the elastic wrap in place and elevate the injured part. Loosen the wrap prior to going to bed. If the injury has been taped, apply the ice directly over the tape. Try to keep off the injured part until checked out by the Health Center.

Ice Massage

Use ice massage whenever possible. Rub an ice cube in a circular motion over the entire injured area. Keep the ice moving. Rub the ice over the area for at least 8 minutes. It will be painful for the first 5 minutes; however, then the anaesthetic effect will take over. Try to regain the normal range of motion, but only move the part to

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the point of discomfort. DO NOT force the part. Range of motion exercises should be continued for 3 minutes. For an ankle injury, range of motion is regained by drawing circles and the alphabet with the toes. Movement should be initiated at the ankle joint, not the hip. For a knee injury, attempt to flex and extend the knee while sitting on a table. Also, pull the patella upward toward the hip by contracting the quadriceps. Do the quad setting exercise for 5 minutes of each waking hour. For any injury, simply move the part through its normal movement pattern.

Ice massage should be applied in sets of three - 8-3, 8-3, 8-3, three times a day. If you can't apply it three times in one time period, do it at least twice - 8-3, 8-3. If you live in a dorm, ice may be obtained from the cafeteria. Tell your RA that you have an injury and you need ice to control the swelling.

Rehabilitation

A major part of the treatment program is the rehabilitation of the injured part. This year, the Women's Physical Education Department has the use of the men's training room facilities during the morning. The day after the injury, report to the men's training room, MPE 172, anytime between 8:00 AM and 1:00 PM.

By reporting to the men's training room faithfully and doing the exercises assigned to you, you will be able to return to practice sooner and with less chance of re-injury. For athletes with moderate-severe injuries, a Physician's Release Form from the Health Center is required before you can return to practice and competition.

Specific Instructions:

REPORT FORMS

1. Indiana State University - Injury Report (WPE)

NAME_____ TIME OF INJURY_____

SCHOOL ADDRESS_____ DATE OR INJURY_____

SCHOOL TELEPHONE_____ INJURY CLASSIFICATION: PE IM INTERC REC

SOC. SECURITY NO._____ NATURE OF INJURY (circle)

BODY PART AFFECTED (circle)

Arm	Hand	Thigh
Hip	Knee	Ankle
Head	Foot	Teeth
Neck	Chest	Finger
Back	Elbow	Shoulder
Wrist	Other_____	

Severe cut Strain
Bruise Dislocation
Fracture
Sprain Re-injury

Other_____

FIRST AID RENDERED:

DESCRIBE HOW INJURY OCCURRED:

SUPPLIES CHECKED OUT (number)
Elastic wraps_____
Towels_____
Crutches_____
Other_____
RETURNED_____

DISPOSITION:
Released_____
Sent to Health Center_____
Sent to Hospital_____
COMMENTS: (Describe injury - evaluate)

_____
Signature of Reporting Official

2. Indiana State University - Medical Report (Coaches' Form)

NAME OF ATHLETE_____ COACH_____

DATE OF INJURY_____ SPORT_____

INJURED IN: Practice Competition Class _____

DESCRIPTION OF INJURY:

PHYSICIAN'S RECOMMENDATION:

RESTRICTIONS:

Expected Date of Return: Practice_____ Competition_____

3. Indiana State University - Medical Report (Physician's Form)

NAME_____ SOC. SECURITY NO._____

INJURED IN: Practice Competition _____ Sport_____

DESCRIPTION OF INJURY: (Findings and Treatment)

Trainer's Remarks:

PHYSICIAN'S RECOMMENDATIONS:

1. No practice until seen by_____
2. No practice until (date)_____
3. Expected return to competition (date)_____
4. Running only_____ Rehabilitation program_____
5. Rehabilitation Program:

6. Practice drills (no scrimmaging)_____
7. No restrictions_____ Signature_____
8. Remarks Date_____

4. Indiana State University - Inactive List

NAME OF ATHLETE	RESTRICTIONS	Expected Date of Return to Practice

5. Indiana State University - Treatment Log

Semester_____

Location_____

No.	Date	Sport	NAME	CONDITION	Tape	I.C.E.	Ice Mass.	Ultrasound	Analg. P.	Whirlpool	Hydroc.	Exercise	Dressing	Pad	Infrared	Ananase	Health C.	El. Wrap	Towel	RETURNED	REMARKS

6. Indiana State University - Injury Description Log

Semester_____

Location_____

Name	Date	Sport	Complaint/Description

7. Weight Chart

DATE		1	2	3	4	5	6.....29	30	31	Total Weight Gain or Loss
NAME	Out									
	In									
	Out									
	In									
	Out									
	In									

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REVIEW

1. Fill-in Questions

   Read the question and fill in the blank(s). Check your answer with the one provided to the left of each question.

2. Situations

   Read the description of the injury and decide how you would handle the situation. Compare your answer with the one given below each situation.

Part 2 Modalities

Heat

48-72

1. Heat should not be applied to an injury for _____ hours after it occurred.

vasodilation

2. The application of heat results in _____ of blood vessels.

3. If heat is applied too soon after the occurence of an injury, vasodilation of the blood vessels might cause additional _____.

swelling

4. Heat should never be applied to an injury where _____ is embedded.

metal

5. Heat should never be applied to the _____ or _____ area.

eyes, genital

6. Heat should never be applied to areas where _____ is lost.

sensation

7. The standard time for a whirlpool treatment is _____ minutes.

15-20

8. The upper temperature limit for a whirlpool treatment is _____ degrees F.

100

9. Constant supervision is required anytime the athlete has _____ or more of her body submerged in a whirlpool.

1/2

10. When an athlete has 1/2 or more of her body submerged in the whirlpool, there is always the chance that the athlete may _____ and drown.

faint

11. Hydrocollator packs must be wrapped in at least _____ layers of towel to prevent burning.

6

12. Hydrocollator treatments should be given for _____ minutes.

20-30

13. In giving an infra-red treatment, the head of the lamp should be _____ inches from the part being treated.

18-24

14. The length of time for an infra-red treatment is _____ minutes.

20

15. _____ the injured part when giving an infra-red treatment to aid gravity in draining the effusion.

elevate

16. Always use a _____ analgesic when applying an analgesic pack.

mild

17. A _____ analgesic is superior to an oil base analgesic because the former can be removed with cold water.

water soluble

18. If an athlete is sensitive to heat, apply _____ to the skin before the analgesic.

vaseline

19. Individuals with _____ or _____ hair, _____ or _____ skin are usually sensitive to the heat.

red, blonde
rough, light

20. When using a contrast bath, always start with _____ and end with _____ water.

hot, cold

21. When giving an ultrasound treatment, keep the sound head _____ to prevent damage to the underlying tissues.

moving

22. Since sound waves do not penetrate the air, it is necessary to apply a _____ agent to the skin such as Dermassage or Baby Lotion.

coupling

23. The standard intensity setting for an ultrasound treatment is _____ watts/sq. cm, but the therapist may need to go as low as 0.5 watts/sq. cm.

1.0-1.5

24. The length of time for an ultrasound treatment is _____ minutes.

6

Ice

25. Ice controls swelling because it acts as a _____.

vasoconstrictor

26. Ice is an _____ because it interrupts the transmission of pain impulses.

anaesthetic

27. When ice is applied to a muscle, the muscle initially tightens then _____ for a varied period of time.

relaxes

28. True-False. Ice cannot cause frostbite because water freezes at 0^{o} C. while tissues freeze at approximately -4^{o} C.

true

29. The three sensations that occur during the application of ice are _____, _____, and _____.

burning, tingling, numbness

30. Immediately following an injury, an ice pack is applied to the part for _____ minutes.

30-90

31. Compression is applied by a _____ elastic wrap prior to the application of the ice pack.

wet

32. True-False. The elastic wrap is wet to speed the conduction of the coldness to the tissues.

true

33. The immediate treatment for an injury consists of _____, _____, and _____.

ice, compression, elevation

34. The total time for immersion of an injury in ice slush is _____ minutes.

30-45

35. Ice slush is ideal for injuries to the _____ and _____ because of the even anaesthetic effect.

hands, feet

36. Ethyl Chloride (spray cold) is dangerous because it can result in _____ if applied improperly.

frostbite

37. True-False. Any form of cold (ice, cold water, cool air) can cause vasoconstriction.

true

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Part 3 Terminology and Emergency Care

infection
1. The greatest danger of an abrasion is that of _____.

scrub
2. To thoroughly clean out an abrasion, it is necessary to _____ the wound gently with sterile gauze.

moist
3. To prevent a scab from forming on an abrasion keep it _____ with a first aid cream.

tetanus
4. _____ is the greatest danger associated with a puncture wound.

bruise
5. A contusion is a _____.

muscle, tendons
6. A strain involves stretching or tearing of _____ tissue and/or the _____.

stretch
7. The immediate treatment for a strain is ice, compression and, if possible, elevation plus placing the muscle on _____.

ligaments
8. A sprain involves stretching or tearing of _____.

above, below
9. To stabilize a fracture, the joints _____ and _____ the injury must be splinted.

true
10. True-False. The one fracture that is classified as a medical emergency is a fracture of the humerus just above the elbow.

femur
11. A fracture that could be classified as a medical emergency is a fracture of the _____.

true
12. True-False. Dislocations, other than fingers and the patella, should not be reduced.

oxygen
13. Shock results in death of the tissues due to insufficient _____ because the supply of blood for circulation is diminished.

direct pressure
14. _____ plus elevation, if possible, is the best method of controlling bleeding.

15. Pressure must be applied continuously for at least _____ minutes to control stubborn bleeding.

five

16. The best method of resuscitation is _____.

mouth-to-mouth

17. If an athlete has trouble breathing and her injury involves damage to the mouth, use _____ resuscitation.

mouth-to-nose

18. When evaluating an injury, the trainer takes into account what is _____, _____, and _____.

seen, felt, heard

19. If possible, compare the _____ part with the _____ part.

injured, uninjured

20. True-False. Swelling is an indication of the severity of the injury.

false

Part 4 Specific Injuries

The Foot

friction

1. A blister is caused by _____.

infection

2. When a blister is punctured, the chance of _____ increases.

shoes, socks

3. Blisters may be caused by _____ or _____ that don't fit properly or by calluses.

lubricant

4. Friction may be reduced by applying a _____ to the soles of the feet.

cool it off

5. If an athlete feels a "hot spot" she should _____ and apply a lubricant before returning to activity.

smooth, soft (moist)

6. Calluses should be filed _____ and kept _____ by applying lanolin.

false

7. True-False. Athlete's foot is extremely contagious.

dry, powder

8. To care for, or prevent athlete's foot, the athlete should _____ her feet thoroughly and put _____ in her shoes and socks.

true

9. True-False. Only those athletes who are sensitive to the virus will be susceptible to plantar warts.

ultrasound

10. Single plantar warts that are less than 6 months old can be successfully treated by _____.

physician

11. Older clusters of plantar warts require the care of a _____.

The Ankle

hinge

12. The ankle is a _____ joint that limits movement to plantar and dorsal flexion.

plantar flexion

13. The ankle is more prone to a sprain in _____ because in that position the talus fits more loosely in the mortise formed by the malleoli.

14. In an _____ sprain the sole of the foot is turned inward thus stretching or tearing the ligaments on the lateral side of the ankle.

inversion

15. In an _____ sprain the sole of the foot is turned outward.

eversion

16. In an inversion sprain the first ligament that is affected is the _____.

anterior talofibular

17. In a mild-moderate inversion sprain the anterior talofibular and the _____ ligaments are usually traumatized.

calcaneofibular

18. In an eversion sprain the _____ ligament is usually involved; however, the ligament is so strong that it rarely tears. Instead the ligament _____ a piece of the medial malleolus resulting in an avulsion fracture.

deltoid,
tears off (avulses)

19. If pain is localized above the malleolus, along the shaft of the fibula, suspect a _____.

fracture

20. If pain is localized immediately below the lateral malleolus the _____ ligament has been stretched or torn.

calcaneofibular

21. If pain is localized along the border of the malleolus suspect a _____.

fracture-
chip or avulsion

22. To provide compression and support for a recently sprained ankle, but still allow for swelling, apply an _____ basketweave strapping.

open

23. The front of an open basketweave is left open to allow for _____.

swelling

24. The athlete with a recent mild-moderate sprain should have her ankle taped continuously in an open basketweave for _____ days depending on the severity of the injury.

3-5

25. Change the open basketweave _____

everyday

26. A vinyl foam _____ is applied to the lateral malleolus to control swelling prior to an open basketweave strapping.

horseshoe

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first

27. Range of motion exercises should be initiated the _____ day after the sprain.

ice, compression, elevation, 30-90

28. The immediate treatment for a sprained ankle is _____, _____ and _____ for _____ minutes.

slush

29. Ice _____ is an excellent method of applying ice to an ankle because of the even anaesthetic effect.

30-45

30. The ankle should be submerged in the slush for a total period of _____ minutes.

range of motion

31. The normal _____ of the ankle should be regained before strengthening exercises are initiated.

open, elastic

32. To provide the additional plantar flexion required by gymnasts and runners, tape the weak ankle in an _____ basketweave or use _____ tape.

closed

33. Maximum support for a weak ankle is obtained by using a _____ basketweave strapping.

remainder

34. It may be necessary to strap the recently sprained ankle the _____ of the season.

inversion, eversion

35. Range of motion exercises for the ankle should include plantar flexion and dorsal flexion as well as _____ and _____.

fifth

36. In a moderate-severe plantar flexion inversion sprain, always check the base of the _____ metatarsal for an avulsion fracture.

The Achilles Tendon

completely torn

37. If plantar flexion does not occur when the gastrocnemius is grasped, the Achilles tendon is _____.

dorsal flexion

38. The mechanism of injury for an Achilles tendon strain is excessive _____ or a muscle imbalance between the plantar flexors and dorsal flexors of the foot.

39. True-False. If the line of the Achilles tendon deviates to the medial or lateral side, the tendon may be completely torn.

true

40. If there is an _____ in the tendon, it may be completely torn.

indentation

41. Besides strapping, applying a _____ to the foot limits dorsal flexion and thus protects the Achilles tendon from over-stretching.

The Arch

42. The two arches that are most susceptible to strain are the _____ longitudinal and the _____.

inner, metatarsal

43. The intrinsic muscles that support the arches are in the _____.

foot

44. The extrinsic muscles that support the arches are in the _____.

lower leg

45. The extrinsic muscles in the lower leg provide support for the arches through their _____.

tendons

46. To fit shoes correctly, the _____ of the shoe should coincide with the ball of the foot.

crease

47. Fit shoes to the _____ of the foot.

width

48. A metatarsal pad should be placed _____ the heads of the metatarsals.

over

49. A longitudinal arch pad is placed along an imaginary line that bisects the _____ toe and the heel.

third

50. During the acute phase of an arch strain prevent additional stress on the arches by eliminating the _____ isometric and _____ from the daily exercise routine.

plantar flexion, toe rises

51. A _____ on any of the metatarsal heads may indicate a fallen metatarsal.

callus

The Lower Leg

52. Shin splints is thought to be caused by _____ because of the anatomical relationship between the extrinsic muscles and the foot.

weak arches

53. Shin splints is thought to be caused by a muscle imbalance because the _____ of the foot are stronger than the _____.

plantar flexors, dorsal flexors

54. Improper running mechanics may cause shin splints because "toe running" places additional stress on the _____ of the feet.

arches

55. Shin splints is defined as pain _____ in the lower leg, except that caused by circulatory disturbances or stress fracture.

anywhere

56. During the acute phase of shin splints eliminate the _____ isometric and _____ because both exercises place stress on the arches.

plantar flexion, toe rises

57. In preseason conditioning, jog _____ not on the toes.

low on the foot

58. When jogging on a track, alternate a _____ lap with a _____ lap to avoid placing too much stress on one leg.

clockwise, counterclockwise

59. In strapping for shin splints, always tape the _____.

arch

60. When strapping the shin, leave the back of the leg open to allow freedom of muscle movement and thus prevent _____.

muscle spasms

61. Shin splints may involve a strain of the _____ or _____ muscles or the _____ between the tibia and fibula.

tibialis anterior
tibialis posterior
interosseus membrane

The Knee

62. The knee is a hinge joint which permits only _____ and _____; however, when the knee is flexed slight _____ is permitted.

flexion, extension, rotation

63. The knee is more vulnerable in _____ because of the rotatory component that is introduced.

flexion

64. The _____ collateral ligament has a superficial as well as a deep attachment.

medial

65. The superficial attachment of the medial collateral ligament is approximately _____ inches below the joint line.

2-3

66. The _____ ligaments crisscross within the joint cavity.

cruciate

67. The _____ cartilage (meniscus) is attached to the collateral ligament; therefore, it is less mobile and more prone to injury.

medial

68. Muscular support for the knee is provided by the _____ group, the _____ group and the _____.

quadricep, hamstring, gastrocnemius

69. Rotatory stress usually results in injury to the _____ ligaments and the _____.

cruciate, cartilage

70. Leverage stress results in a hinge action that causes damage to structures on the _____ side of the force.

opposite

71. Leverage stress usually causes injury to the _____ ligaments.

collateral

72. True-False. The cartilage is often torn in non-contact movements such as cutting.

true

73. When a cartilage is torn, point tenderness is localized at the _____ and swelling is rapid.

joint line

74. True-False. Cartilage tears usually occur with a first time sprain.

false

75. When the medial collateral ligament is torn, pain may be localized _____ the joint line, immediately _____ the joint line, and _____ inches below the joint line, depending on which part of the ligament is affected.

above, below, 2-3

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cruciate

76. When a _____ ligament is torn, pain is felt within the knee joint.

locked

77. When a cartilage is torn, the knee is often _____ because a piece of cartilage catches in the joint.

medial, anterior, medial

78. The three structures involved in the Unhappy Triad are the _____ collateral ligament, the _____ cruciate ligament, and the _____ cartilage.

toe walking

79. _____ is an attempt to splint the knee and is usually an indication of a moderate-severe sprain.

seat-of-the-pants

80. One of the best methods of removing an athlete with a mild-moderate knee or ankle sprain is the _____ carry.

2/3
40

81. The hamstrings are capable of lifting only _____ as much weight as the quadriceps muscles; therefore, if the quadriceps can lift 60 pounds, the hamstrings can lift _____ pounds.

rotation

82. Splinting the knee with strips of vinyl foam prevents _____ of the knee thus eliminating additional stress and reducing the pain.

psychological

83. _____ rehabilitation following a knee injury is perhaps more difficult than physiological rehabilitation.

strengthen the muscles that cross the joint

84. The best method of stabilizing a sprained knee is to _____.

true

85. True-False. Braces do not provide adequate stabilization for a sprained knee because the cuff loses it elasticity over a period of time.

flex, extend

86. To reduce a dislocated patella tell the athlete to _____ her hip and _____ her leg. The patella should slide back into its natural position.

true

87. True-False. Females have a tendency toward dislocation of the patella because of the broadness of their hips.

88. True-False. A torn cartilage and a dislocated patella that has spontaneously reduced itself are often confused because the symptoms and mechanism of injury are similar.

true

89. Prepatellar bursitis is often the result of excessive _____ or banging on the knees.

kneeling

90. The application of either _____ or _____ has been successful in reducing the pain associated with prepatellar bursitis.

ice, heat

91. When active, apply _____ to the prepatellar bursa by means of an elastic wrap and a vinyl foam pad.

compression

92. During preseason conditioning focus on strengthening the _____ group, the _____ group and the _____ to prevent knee injuries.

hamstring, quadricep, gastrocnemius

Muscles

93. Following a quadriceps strain, if the range of flexion is less than _____ degrees suspect a moderate-severe strain.

90

94. Following a hamstrings strain, the athlete should feel pain on a _____.

straight leg lift

95. To place the quadriceps on stretch have the athlete sit with her knees _____.

flexed

96. Besides a hyperextension strapping, apply a _____ to the foot to prevent overextension of the leg following a hamstring strain.

heel lift

97. _____ stretching is safer than _____ stretching.

static, dynamic

98. A _____ may be substituted for an analgesic when applying an analgesic pack.

back plaster

99. A figure 8 strapping using a "live rubber wrap" is the only way of strapping a _____ strain to take stress off the muscles.

quadriceps

100. True-False. The pattern for taping a groin strain is essentially the same as that for a quadriceps strain except that it is higher up on the thigh.

true

101. True-False. All injuries heal with scar tissue. In muscle strains, the scar tissue is a weak point because it is an inelastic "plug" in an elastic tissue; therefore, the athlete is prone to re-injury.

true

102. To relax a muscle spasm put the muscle on _____ and apply ice.

stretch

The Shoulder & Elbow

103. Following an anterior dislocation of the shoulder, the arm is held in a slightly _____ position.

abducted

104. The deltoid contour is _____ following an anterior dislocation.

flattened

105. True-False. The trainer should reduce an anterior dislocation of the shoulder to avoid increased muscle spasm.

false

106. The mechanism of injury for bicipital tendinitis and bursitis is repeated forced _____ rotation.

internal

107. Range of motion is restricted in _____ and _____ in bicipital tendinitis and bursitis.

abduction,
outward rotation

108. The mechanism of injury to the elbow, either a sprain-strain or dislocation, is falling on the _____.

outstretched hand

109. Tennis elbow is defined as an inflammation of the _____ epicondyle of the elbow.

lateral

110. The mechanism of injury for tennis elbow is repeated forearm _____ and _____.

supination,
pronation

111. Excellent splints for dislocations - to splint them as they lie - are a chicken wire splint, a ladder splint, and a _____ splint.

cardboard

112. True-False. In many cases the individual will splint an arm injury by holding the arm against her body with the uninjured arm.

true

The Wrist

113. The mechanism of injury for a navicular fracture or wrist sprain is falling on an _____.

outstretched hand

114. When the navicular is fractured, pain is localized in the _____.

anatomical snuff box

115. When the wrist is sprained, pain will be more generalized and the athlete will be unable to _____ her wrist.

flex

116. A fracture of the navicular is slow in healing because the bone has poor _____. Improper treatment could result in _____ of the navicular.

blood supply, death (necrosis)

117. When taping a wrist make sure the fingers are _____ to allow for freedom of movement when the strapping is completed.

spread

The Finger

118. Splint a proximal or middle fracture of the phalanx in _____ and a distal fracture in _____.

flexion, extension

119. In a drop finger, the _____ is avulsed from the distal segment of the phalanx.

extensor tendon

extension

120. Splint a drop finger in _____.

121. True-False. A dislocated finger should not be reduced.

false

122. To provide a better grip for reducing a dislocated finger, spray the athlete's finger and your hands with _____.

tape adherent

123. True-False. A dislocated thumb should not be reduced.

true

124. In a fracture of a phalanx pain will be localized _____ the joints.

between

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125. In a chip fracture pain will be localized _____ the joint.

at

126. When taping two fingers together for the purpose of splinting, try to leave the _____ finger free. This will allow the individual to grasp objects.

index

127. If flexion of the fingers is required when taping one finger to the next, apply tape strips _____.

between the joints

The Head

128. Concussions may result from a direct blow to the head or an indirect blow such as a blow to the _____ or a fall on the _____.

chin,
gluteus maximus

129. The individual with a mild concussion will appear to be _____, what the sportscasters refer to as being "shook up."

dazed

130. Ask the athlete simple questions that require _____ word answers to determine if she is oriented to her surroundings.

1-2

131. Test the athlete's sense of feel by _____ her skin or _____ some hair on her arm or leg.

pinching,
pulling

132. Seepage of a clear fluid from the mouth and/or ears is an indication of a _____.

skull fracture

133. True-False. If the athlete loses her balance when asked to stand with her eyes closed, she has a positive Romberg sign indicating some neurological impairment.

true

134. A concussion is a _____ injury; therefore, symptoms may not be evident for several hours.

slow reacting

135. True-False. Immediately following a blow to the head, give the athlete aspirin to relieve the pain.

false

136. Use _____ to help revive an unconscious athlete but pass the capsule under her nose so she can smell the fumes. To prevent the athlete from jerking her head in reaction to the smell, hold it steady.

ammonia

137. Always check to see if the athlete is _____ because a moderate-severe concussion may affect the respiratory center. Make sure the airway is maintained for it may become obstructed with mucus or vomit.

breathing

138. True-False. Scalp wounds bleed freely because the area is well supplied with capillaries.

true

139. Clean a laceration _____ to remove all the dirt particles.

lengthwise

140. To close a laceration, temporarily or permanently, apply a _____ bandage or a Steri-strip (3M Company).

butterfly

141. Suturing is necessary if the laceration is more than _____ inch in length and _____ inch in depth.

1/2
1/8

142. True-False. To control the bleeding of a scalp wound apply direct pressure.

false

143. Compression applied to a scalp wound may cause an _____ in intracranial pressure that could result in damage to the brain.

increase

144. To stop a scalp wound from bleeding, apply an _____.

astringent

145. True-False. If an athlete blows her nose after receiving a blow to the eye, she is likely to cause the hemorrhage to increase and the eye to close.

true

146. To stop a nose bleed, it is necessary to pinch the nostrils continuously for at least _____ minutes.

5

147. If pinching the nostrils does not control the bleeding, paint the bleeding area with an _____.

astringent

148. True-False. The proper position for an individual with a bloody nose is lying down on the side of the bleeding nostril.

true

149. True-False. An athlete may not play with a gauze or cotton plug in her nostril.

false

150. Before inserting a plug into a bleeding nostril, apply an astringent to the sides and a _____ to the tip.

lubricant

151. True-False. In an unconscious athlete contact lenses should be removed if at all possible and if it can be done safely.

true

152. To remove contact lenses use a suction cup device that is available from most opthalmologists or the _____.

rubber end of a medicine dropper

Heat Stress

153. When the temperature is above _____°F. and the humidity over _____% all outdoor activity should be cancelled.

90,70

154. _____ is the body's major cooling mechanism; however, it becomes more and more inadequate as the humidity increases.

sweating

155. In heat _____ the skin is moist and cold and the body temperature is normal or subnormal.

exhaustion

156. In heat _____ the skin is red and dry and the body temperature is elevated to 105-106°F.

stroke

157. Heat _____ is a life or death situation in which the body temperature must be returned to normal within a few minutes.

stroke

158. To prevent heat stress the coach must acclimatize her athletes to the environment during the first week of practice. Practices should be _____ and _____, and water breaks taken when the athlete desires water, not at a set time.

short, hard

159. _____ may be as important as salt in preventing heat stress.

potassium

160. If an athlete takes salt tablets, make sure they are _____ or impregnated.

slow releasing

161. True-False. Salt tablets may be dangerous if the athlete overloads the body with salt without taking in adequate amounts of water to replace that which is lost through sweating. Furthermore, the high concen-

tration of salt in the intestines causes the diffusion of fluid into the area by osmosis. This further decreases the volume of circulating blood.

true

162. Heat stress tends to be a _____ disorder.

progressive

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Situations: Read the situation and decide on a solution to the problem. An answer is given below each situation.

1. A softball player slides into second base and scrapes the back of her thigh. What kind of injury do you suspect and how would you treat it?

   Abrasion - Clean with soap and water or Cinder Suds. Gently scrub the area with a sterile gauze pad to remove all the dirt. Apply hydrogen peroxide to foam out any remaining dirt. Keep the wound moist by applying a first aid cream. Dress the wound and bandage. It might be necessary to encircle the thigh with an elastic wrap to hold the dressing in place, especially if the athlete returns to competition. Change the dressing daily. Do not let a scab form.

2. In flag football two opposing players run into each other. One receives a laceration to the forehead. Initial evaluation eliminates the possibility of head (concussion) and neck injuries. How would you treat the laceration?

   Apply light pressure with a sterile gauze pad to stop the bleeding. If the bleeding is stubborn, paint the area with an astringent (Nitrotan). Otherwise, clean the area lengthwise with soap and water. Apply an antiseptic, dressing and bandage. If the athlete returns to the game, apply tape adherent around the edges of the wound to hold the bandage in place. Two or more butterfly bandages will be needed to close the wound temporarily if it is more than 1/2 inch long or 1/8 inch deep. Cover the butterfly bandages with a dressing and bandage.

3. In softball an outfielder receives a puncture wound while trying to keep the ball from going over the fence. How would you care for a puncture wound?

   Clean around the wound but avoid additional contamination. Apply a sterile dressing and bandage in place. Refer to a physician for cleaning of the wound and a tetanus shot.

4. A basketball player comes down on her opponent's foot and turns her ankle (sole inward). What type of sprain do you suspect and what is the immediate care?

   Inversion Sprain - After evaluating the injury and eliminating the possibility of a fracture, apply a wet elastic wrap from the base of the toes to just below the belly of the gastrocnemius. Place an ice pack (wet towel with ice chips) over the involved area. Hold it in place with a dry elastic wrap and elevate the ankle above the hip. The ice pack should remain in place for 30-90 minutes. Or submerge the ankle in ice slush as long as the athlete can stand the discomfort. When she can no longer tolerate the

ice slush, tell her to take her ankle out and warm it by room air. Total time of submersion should be 30-45 minutes. After the initial ice treatment, tape the ankle in an open basketweave with a vinyl foam horseshoe around the lateral malleolus (ankle bone).

5. The knee of a field hockey player "gives way" when she attempts to cut. She complains of pain along the joint line; however, the knee is not locked. How would you 1) remove the athlete from the field, and 2) prevent rotation of the knee after the initial application of ice, compression and elevation?

   After evaluating the injury, remove the player by the seat-of-the-pants carry. Apply ice, compression and elevation for 30-90 minutes on the sideline. After removing the ice, wrap the leg with elastic wraps from approximately 6 inches below the knee to 6 inches above the knee. To prevent flexion and thus limit rotation, place a strip of vinyl foam (8-10" long) along each side of the knee. Give the athlete crutches. Refer her to a physician, preferably an orthopedic surgeon with a knowledge of women's sports.

6. A volleyball player falls on her outstretched hand and dislocates her elbow. What is the immediate treatment?

   If the athlete is comfortable holding the arm against her body, you do not need to splint the injury. Otherwise, splint the elbow as it lies with a cardboard, chickenwire or ladder splint. Apply ice and a sling. Treat for shock and transport to a hospital.

7. A shortstop stops a line drive with her non-glove hand. She complains of pain in the middle segment of the index finger. What is the immediate treatment?

   Splint the finger in flexion by grasping an elastic wrap or roll of gauze. Submerge the hand in ice slush.

   How would you splint the finger with a tongue depressor?

   Cautiously bend the tongue depressor to break some of the fibers. Retain its curved position by placing a "bow string" of tape from one end to the other. Encircle the tongue depressor with tape to pad it.

8. A basketball player feels a "hot spot" on the ball of her foot. What should she do to prevent the formation of a blister?

   Cool off the area with cool air, cold water or ice. Apply a lubricant to the foot and shake powder in the shoes. If more protection is desired, encircle the foot with combine and tape it in place. Put a lubricant underneath the combine and on top of the tape.

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9. A gymnast rips her palm. How would you treat it?

   Clean the chalk out of the rip with soap and water. Use hydrogen peroxide to foam out the remaining chalk. Either paint the area with tape adherent and cover with a small piece of tape, or apply New Skin to seal off the rip. The treatment is the choice of the gymnast. Apply tape grips.

10. A softball pitcher receives a blow to the shin from a line drive. After the physician releases her for practice a week later, how would you protect the contusion?

    Cut a donut out of 3/8 inch vinyl foam and hold it in place with elastic tape or an elastic wrap.

11. A swimmer has a cramp in her gastrocnemius. What is the immediate treatment?

    Place the muscle on stretch by dorsal flexing the foot and grasp the muscle. Later massage the muscle with ice.

12. A hockey player is hit on the head by a hockey ball. She appears to be okay after an initial check, but later complains of being nauseated and vomits. What type of injury do you suspect and how would you care for it?

    Concussion - Have the athlete lie down and treat her for shock. Turn her head to the side to avoid aspiration of the vomit. Check the airway frequently. Apply a cold towel to the neck and forehead. Summon medical help and an ambulance.

13. A basketball player is hit in the face by a ball and receives a bloody nose. It could not be controlled by 5 minutes of digital pressure. How would you attempt to stop the bleeding?

    First, paint the area with an astringent (Nitrotan). If it does not control the bleeding, use a dental plug or Tampax. Cut the Tampax in half and a "V" in the tip. Spray the dental plug or Tampax with an astringent and lubricate the tip with Vaseline. Insert the plug in the bleeding nostril but leave the end sticking out for easy removal. Wet the plug with water before removing it.

14. A distance runner is hyperventilating following a mile run. She is anxious because she cannot catch her breath. How would you get her to breathe naturally?

    Have the athlete lie down and breathe into and out of a paper bag or hold her breath. If she is too anxious to cooperate, tell her to tilt her head back and elevate her shoulders. Place something under her shoulders. Reassure the athlete and get her to relax.

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15. A sprinter strains her hamstring coming out of the blocks. After 72 hours you decide to apply an analgesic pack. How would you prevent 1) the grease from soaking through the elastic wrap, and 2) the pack from falling down?

    If you use an oil base analgesic, cover the combine with a sheet of plastic wrap, or use a Pampers Diaper or Cramerol as a covering. Use a water soluble analgesic or a piece of a Johnson and Johnson back plaster. Wrap the elastic wrap around the waist (figure 8).

A P P E N D I X

HEAT AND HUMIDITY IN SPORTS

I. Acclimatization - becoming adjusted to the environment in which one is going to be active.

A. The coach must take into account:

1. Temperature
2. Humidity
3. Clothing
4. Activity Engaged In
5. Physical Condition of the Athlete

B. Early season practices must be progressive to achieve acclimatization, but at the same time, avoid heat stress.

1. Alternate work and rest periods
2. Provide plenty of water

II. Methods of Measuring Environmental Conditions

A. Sling Psychrometer - take reading on field before practice.

1. Index [1]

Wet Bulb & Dry Bulb Temperature
Determine the Relative Humidity WBT/DBT

Temperature	Humidity	Activity
80-90	Under 70%	OK
80-90	Over 70%	Caution, Rest
90-100	Under 70%	
90-100	Over 70%	Shorten Practice
Over 100		Change Time

2. Dealers that Handle Sling Psychrometers

a. Backarack Instrument Co., 200 N. Braddock Ave., Pittsburg, Pennsylvania (#1323 Psychrometer)

b. Harshaw Scientific Co., 8920 Laisy Ave., Cleveland, Ohio (#1323 Psychrometer)

c. Mason Supply Co., 985 Joyce Ave., Columbus, Ohio or 2628 Keruper Lane, Cincinnati, Ohio (#1323 Psychrometer)

d. Taylor Products Division, Consumer Products Division, P.O. Box 2116, Asheville, North Carolina (#1323 Psychrometer)

e. School Health Supply Co., 300 Lombard Road, Addison, Illinois (SAC-853 Psychrometer)

B. Wet Bulb Globe Thermometer (WBGT) - more accurate than Psychrometer

1. To determine the index, add the following:

70% of the wet bulb reading
20% of the black globe reading
10% of the dry bulb reading

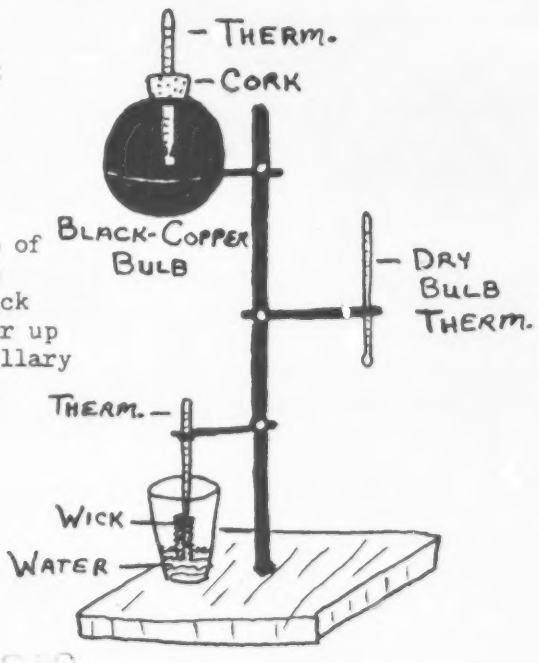
2. Index [2]

82-85	Alert for Possible Curtailment
85-90	Reduced or Curtailed
90+	All Training Stopped

3. Materials needed to construct a wet bulb globe thermometer

Stand
3 Thermometers
3 Clamps
Copper float for toilet tank
Black Paint - flat
Cork
Wick
Glass

Do not put tip of thermometer in water. The wick will draw water up to tip by capillary action.



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III. Weight Loss - 1 lb = 3500 calories

A. Caloric Expenditure - negligible

Running at 5 mi/hr - 7.5 CAL/kg of body weight/hr
Swimming - 6.0 CAL/kg of body weight/hr
Bicycling - 3.5 CAL/kg of body weight/hr

B. Fluid Loss

For every two pounds of body weight that the athlete loses, she has lost one quart of fluid.

C. Affects on Athlete

1. 1% Loss of Body Weight

a. Decrease in reflex time

b. Decrease in strength

c. Some physiological impairment

2. 3% Loss of Body Weight

a. Increase in pulse rate

b. Increase in rectal temperature

c. Decrease in mental alertness

d. Decrease in reflex response

The athlete is approaching heat exhaustion as she approaches a 6% loss of body weight.

3. Heat Exhaustion

a. Increase in respiration which results in more fluid loss

b. Decrease in blood volume

c. Decrease in blood pressure

d. Nausea and vomiting which results in more fluid loss

e. Weakness and difficulty in muscular movement

The athlete is approaching heat stroke.

4. Heat Stroke

   a. Lethargy

   b. Light-Headed

   c. Dizzy

   d. Confusion

   e. Vomiting

   f. Diarrhea

   g. Muscle Cramps

   h. Unconsciousness

   i. Elevated Temperature (critical temperature at 108° F.)

IV. Prevention of Heat Stress

A. Acclimatize

B. Weight Chart - see chart in Part VI

Each athlete should weigh herself before and after practice and games. All weight lost should be regained before the next practice to avoid chronic water loss.

C. Urinary Clearance

To rid the body of waste products from exertion, the athlete should have a urinary output of 1000-1500 cc/day. If fluid replacement is inadequate, urinary clearance is affected and the athlete may develop a sub-clinical uremic condition.

D. Prehydrating

The athlete with a water loss problem should drink 1-3 quarts of fluid prior to the practice. Spread the intake out over several hours.

E. Salt Solution

6 quarts of water 1 level tsp of salt Wylers lemonade for flavor*	20 milliequivalents of potassium/quart may be added

*Using a flavoring that requires the addition of sugar is undesirable. Sugar increases the emptying time of the intestine.

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1. Murphy, Robert. "Heat Illness," The Journal of Sports Medicine 1 (4): 26, November, 1973.

2. Ryan, Allan. "Heat Stress and the Vulnerable Athlete," The Physician and Sportsmedicine 1 (1): 46, June, 1973.

3. Westerman, Richard and Charles Martin. "The Case Against Fluid Restrictions," The Physician and Sportsmedicine 2 (7): 24, July, 1974.

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[1]Allan Ryan, "Heat Stress and the Vulnerable Athlete," The Physician and Sportsmedicine, June 1973, p. 51.

[2]Ibid.

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